

Design, synthesis and biological evaluation of new synthesized morpholinopyrimidine-5-carbonitrile derivatives as dual PI3K/mTOR inhibitors

Ghada S. Rady¹, Moshira A. El-Deeb², Marwa T. M. Sarg², Azza T. Taher^{3,4,*}, Amira A. Helwa^{5,*}

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- 1 Directorate of Health Affairs in Giza, Ministry of Health, Egypt.
 - 2 Department of Pharmaceutical Organic Chemistry, Faculty of Pharmacy (Girls), Al-Azhar University, Cairo, Egypt.
 - 3 Department of Pharmaceutical Organic Chemistry, Faculty of Pharmacy, Cairo University, Cairo 11562, Egypt.
 - 4 Department of Pharmaceutical Organic Chemistry, Faculty of Pharmacy, October 6 University (O6U), 6th of October city, Giza 12585, Egypt.
 - 5 Department of Pharmaceutical Organic Chemistry, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology (MUST), 6th of October city, Giza, Egypt.

*Correspondence:

Dr. Amira A. Helwa

Department of Pharmaceutical Organic Chemistry, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology (MUST), Al-Motamayez District, P.O. Box: 77, 6th of October city, Giza, Egypt.

Email: amira.helwa@must.edu.eg

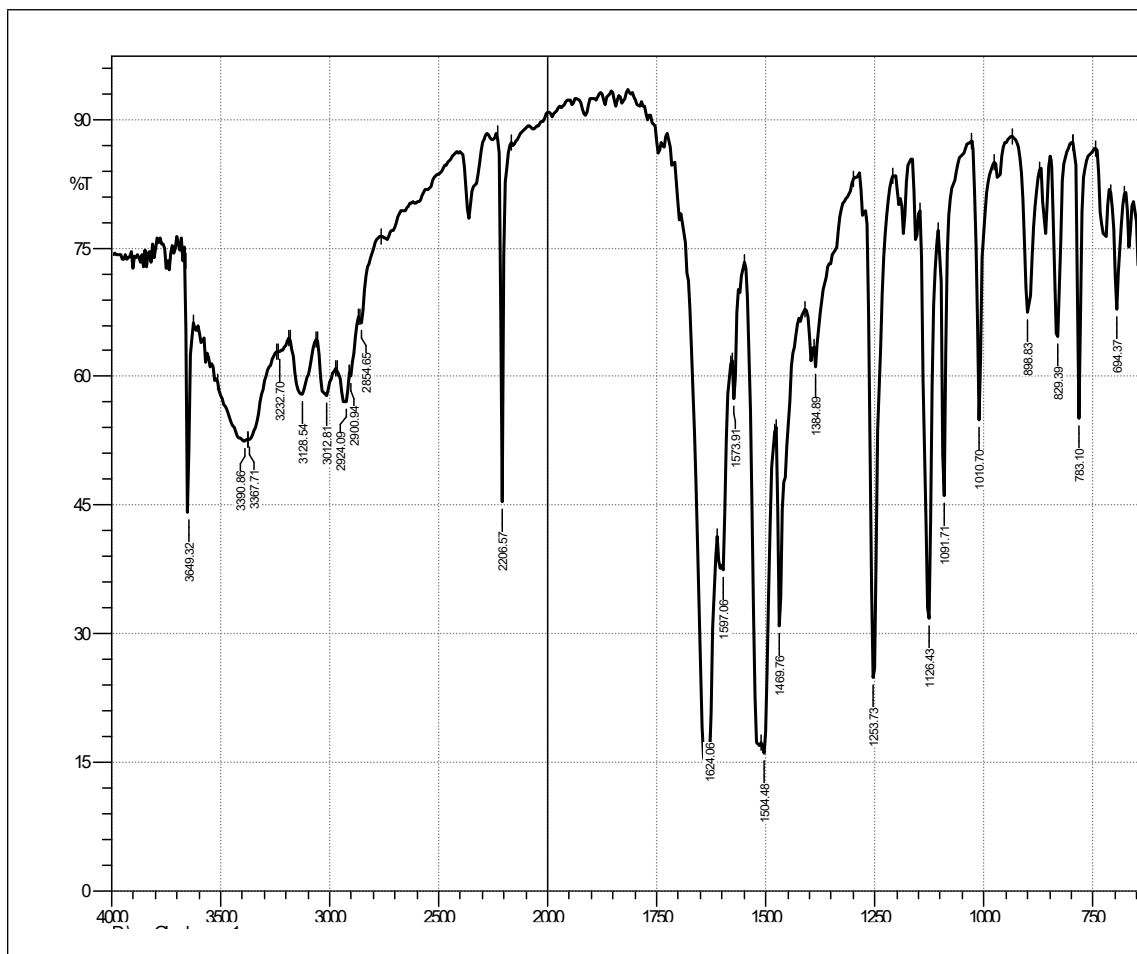
ORCID: 0000-0002-3330-476X

Prof. Dr. Azza T. Taher

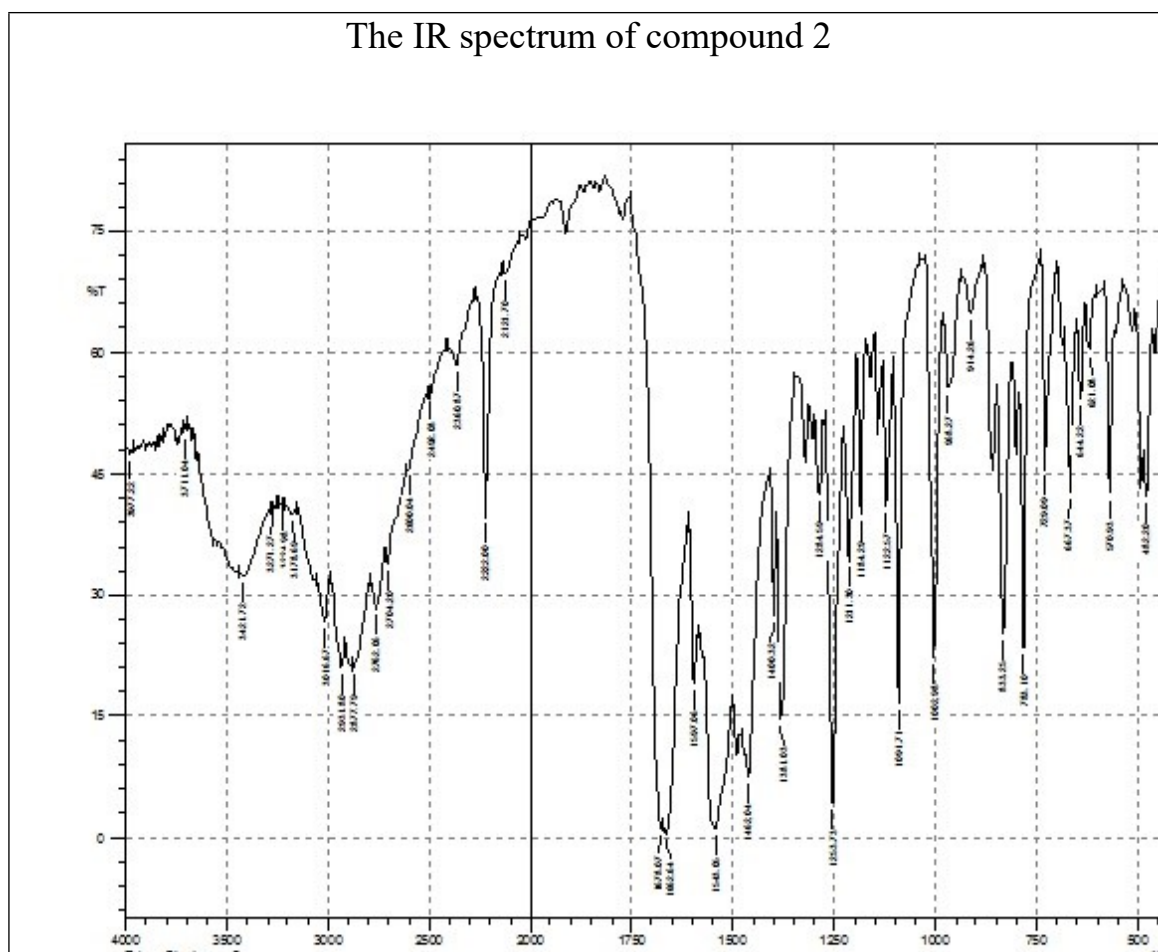
Department of Pharmaceutical Organic Chemistry, Faculty of Pharmacy, Cairo University, Cairo 11562, Egypt.

Email: azza.shalaby@pharma.cu.edu.eg

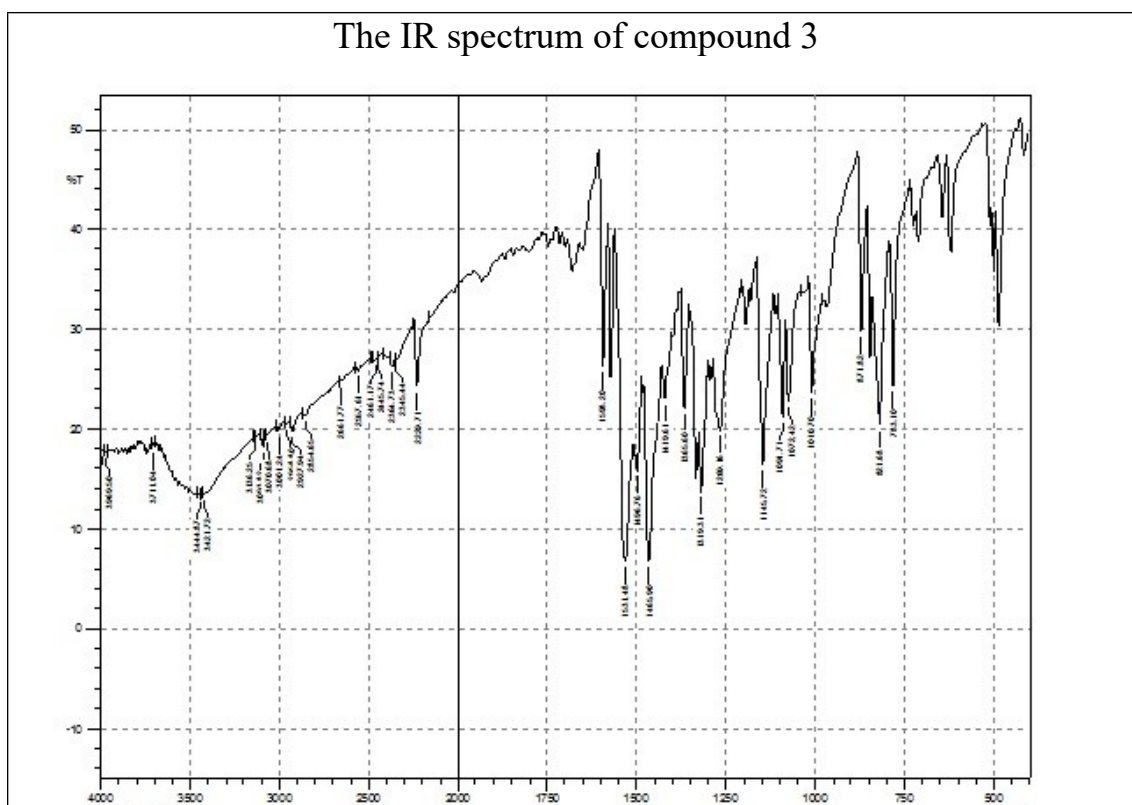
Spectral data of compound 1



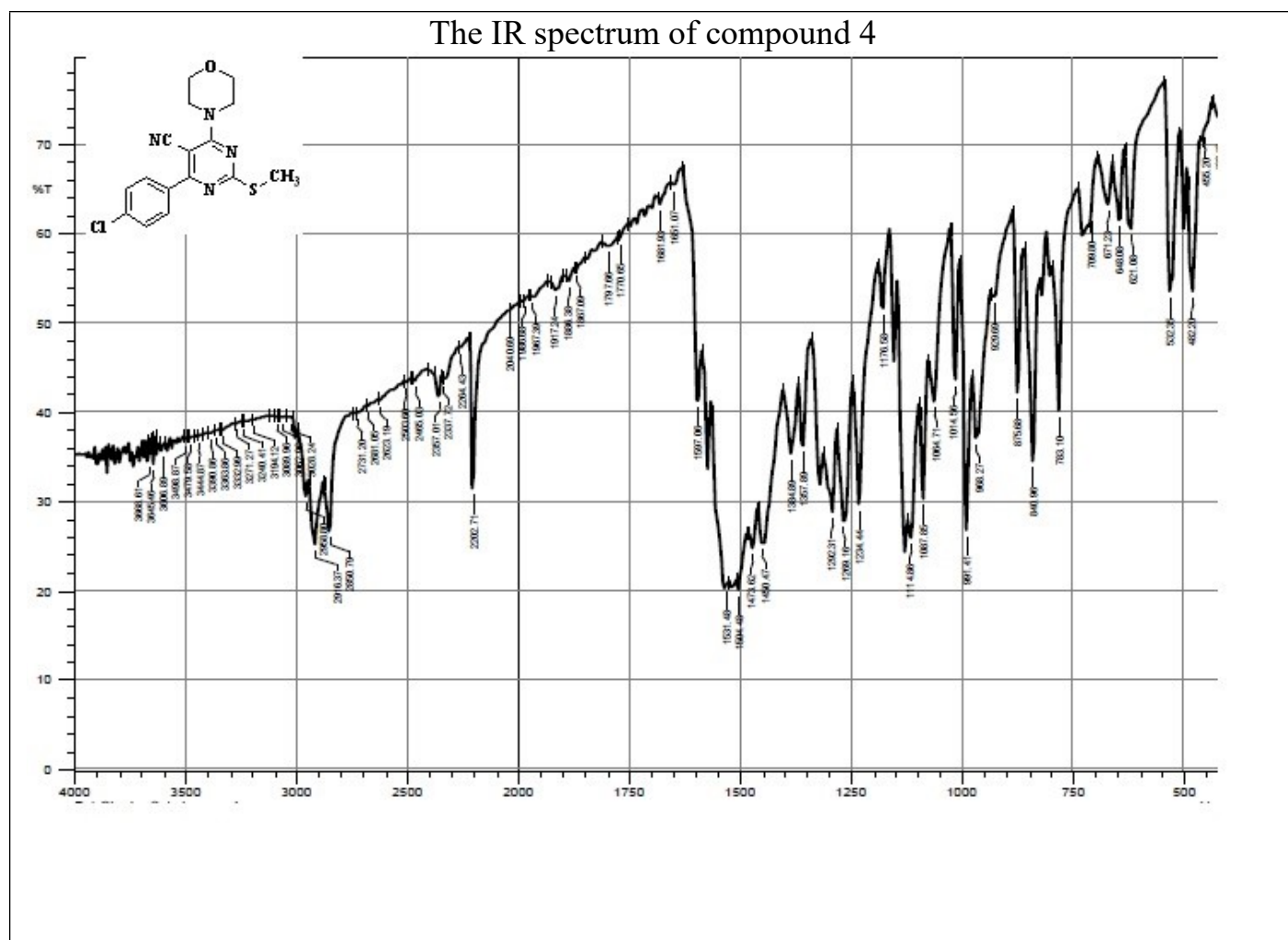
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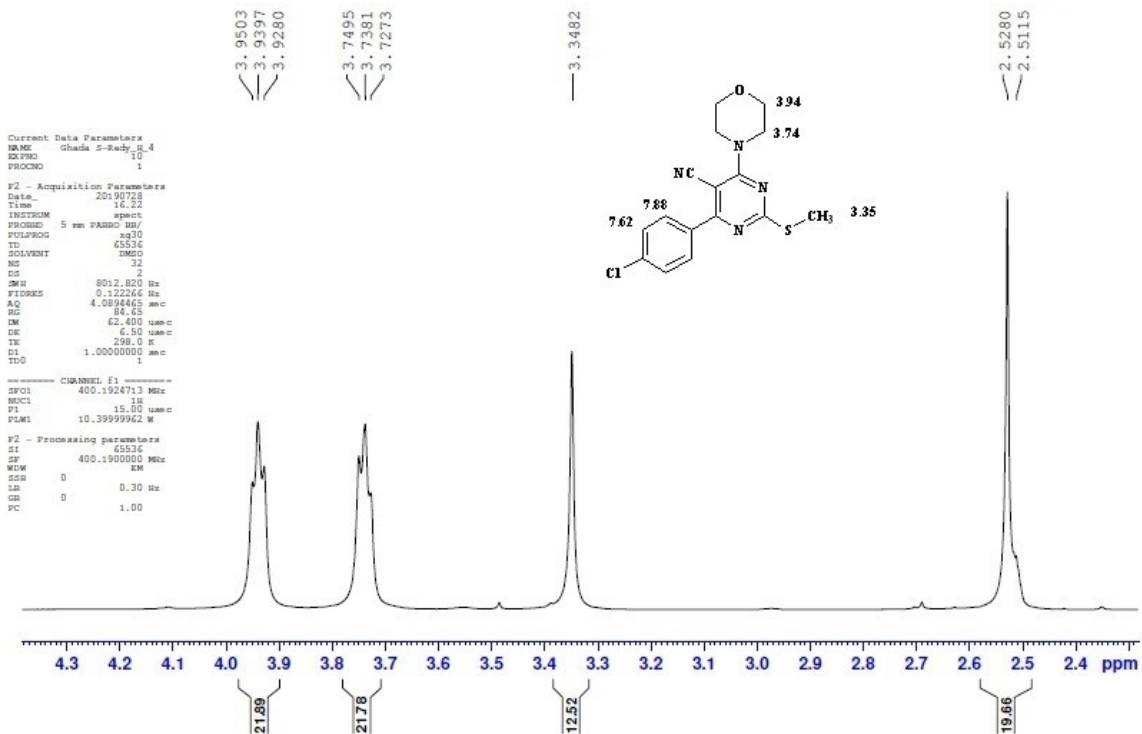
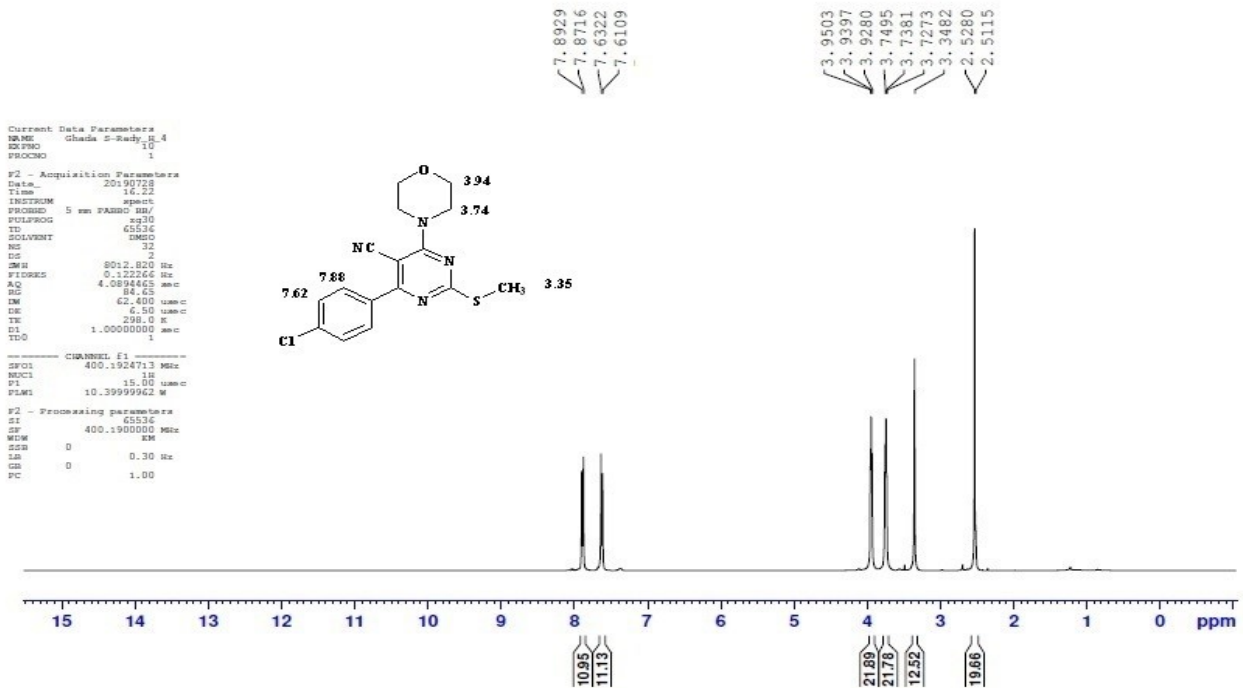
Spectral data of compound 3



Spectral data of compound 4



The ¹H NMR spectrum of compound 4

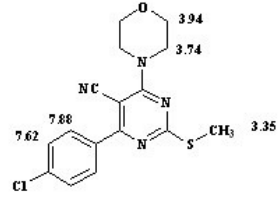


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 PROCNO: 1

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 PULPROG: zg30
 TD: 65536
 SOLVENT: DMSO
 NS: 32
 DS: 2
 SWH: 8012.800 Hz
 FIDRES: 0.122266 Hz
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 RG: 84.65
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 TE: 298.0 K
 D1: 1.00000000 sec
 TSD: 1

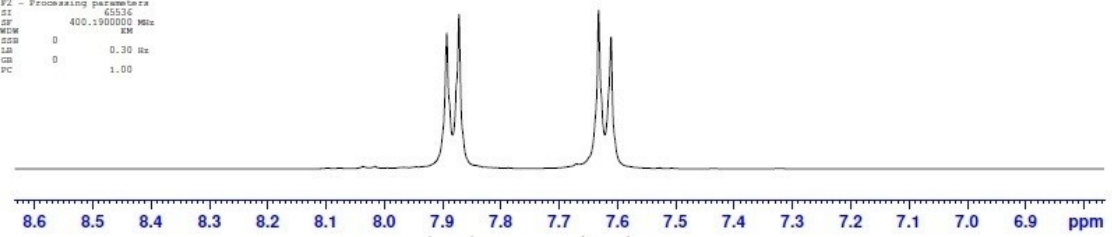
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 NUC1: 1H
 P1: 15.00 usec
 PLW1: 10.39999962 W

F2 - Processing parameters
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 WDW: EM
 SSB: 0
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 GB: 0
 PC: 1.00



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 7.8716

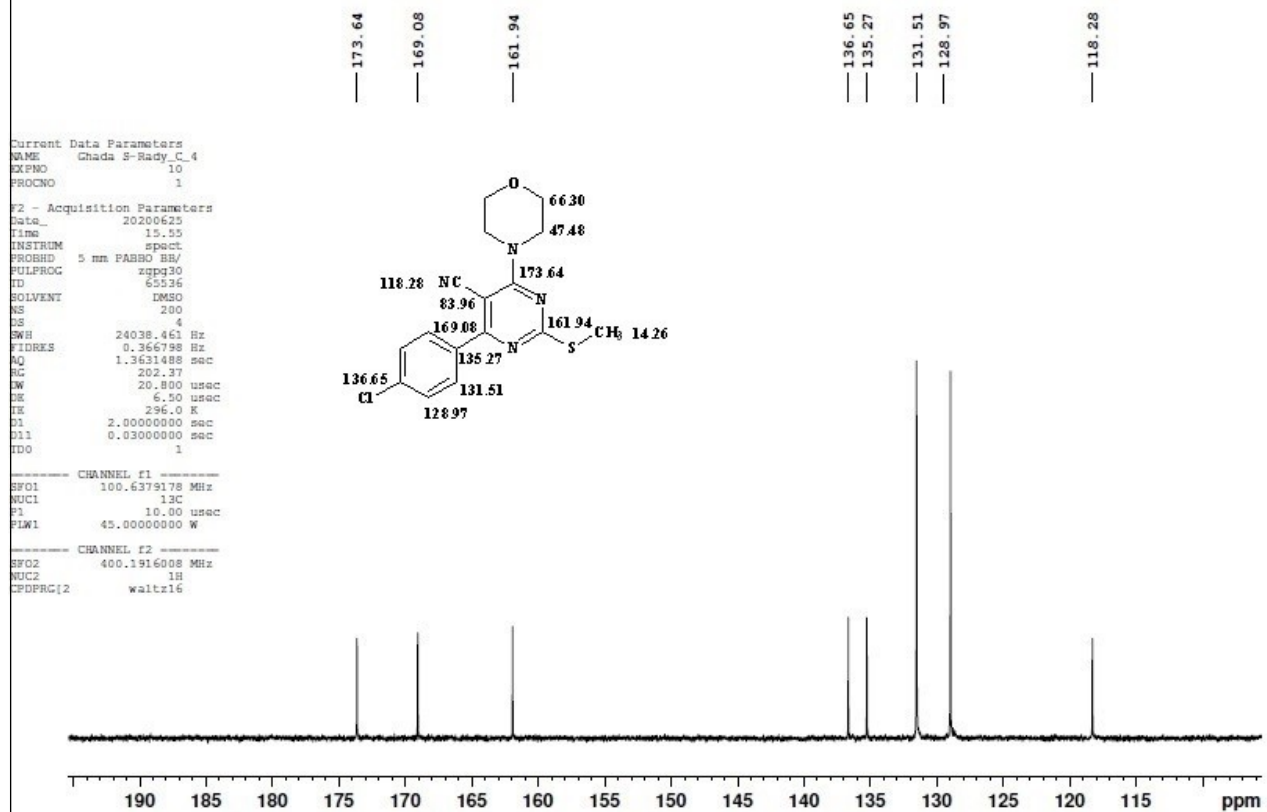
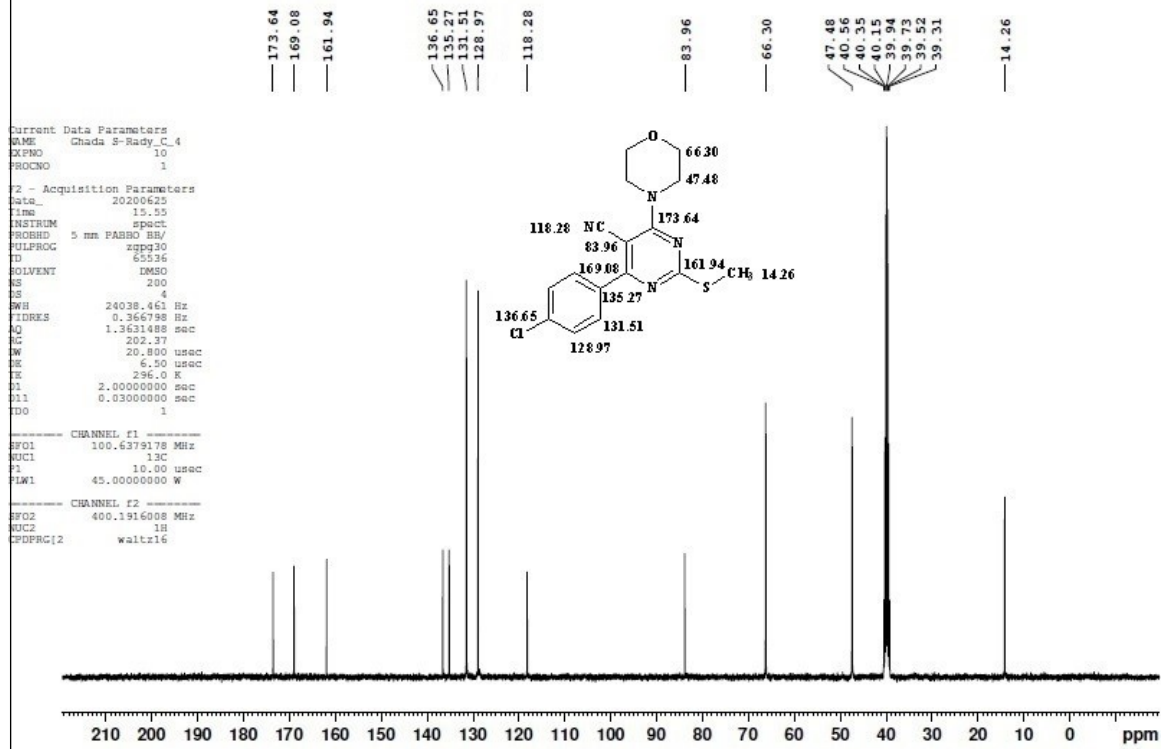
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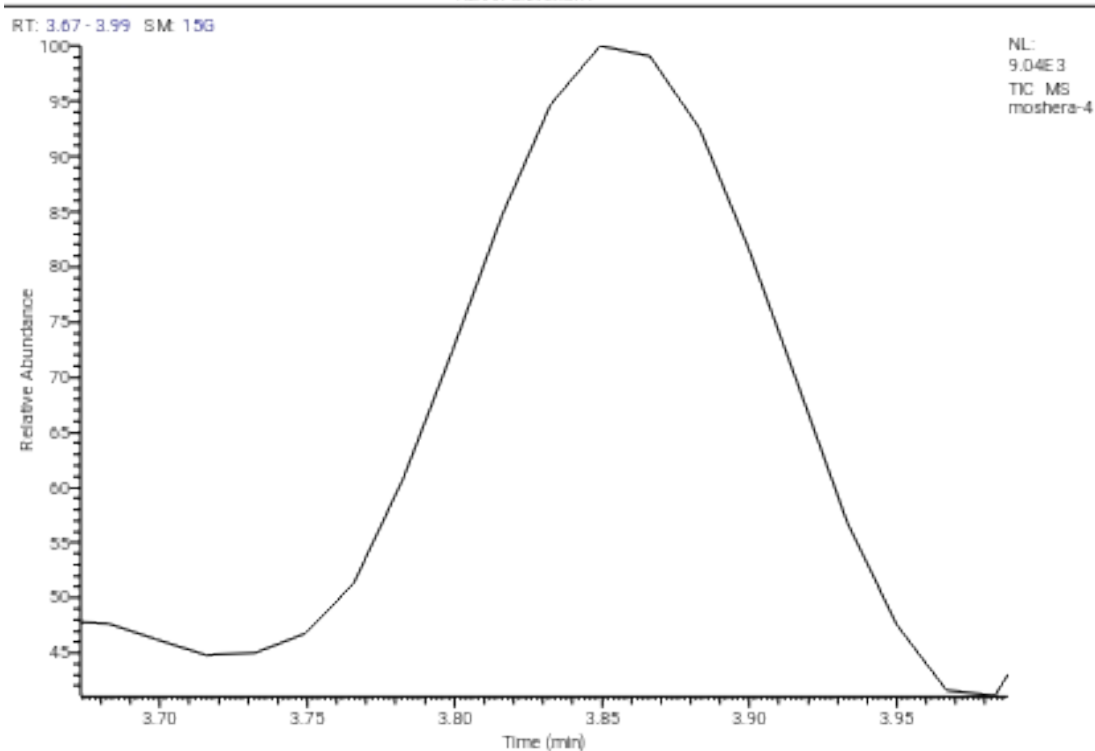
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11.13

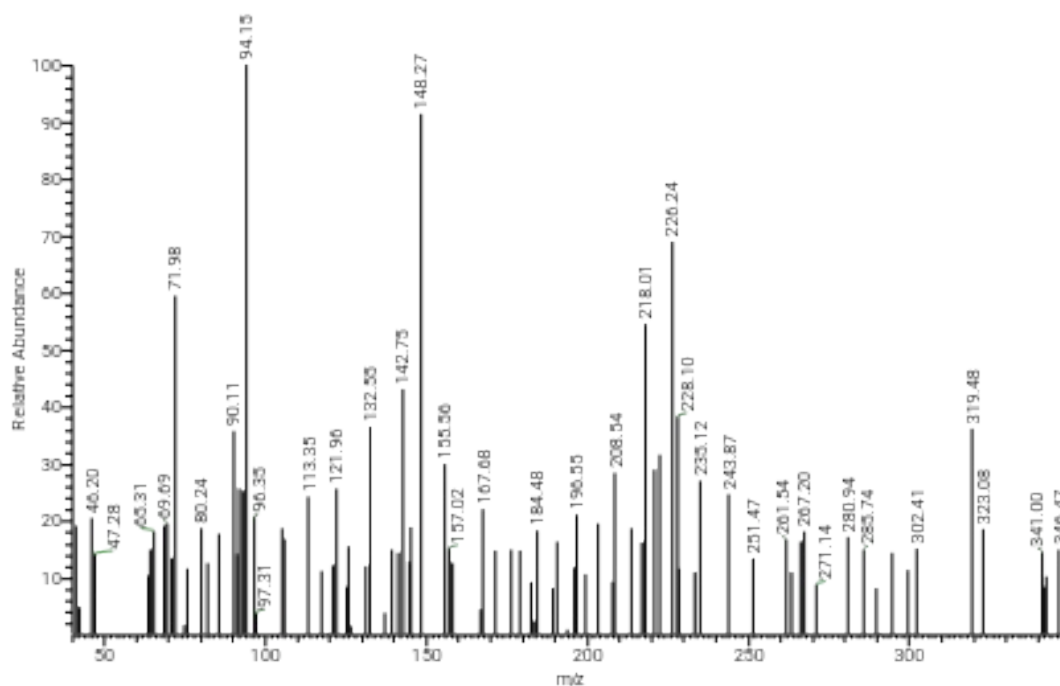
The ¹³C NMR spectrum of compound 4



The mass spectrum of compound 4

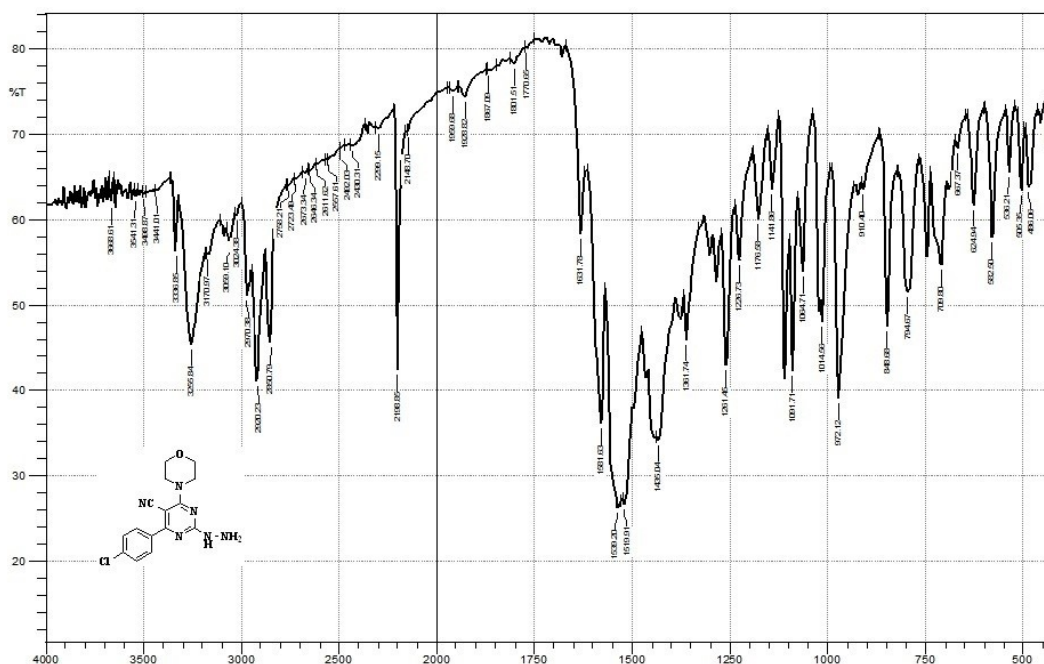


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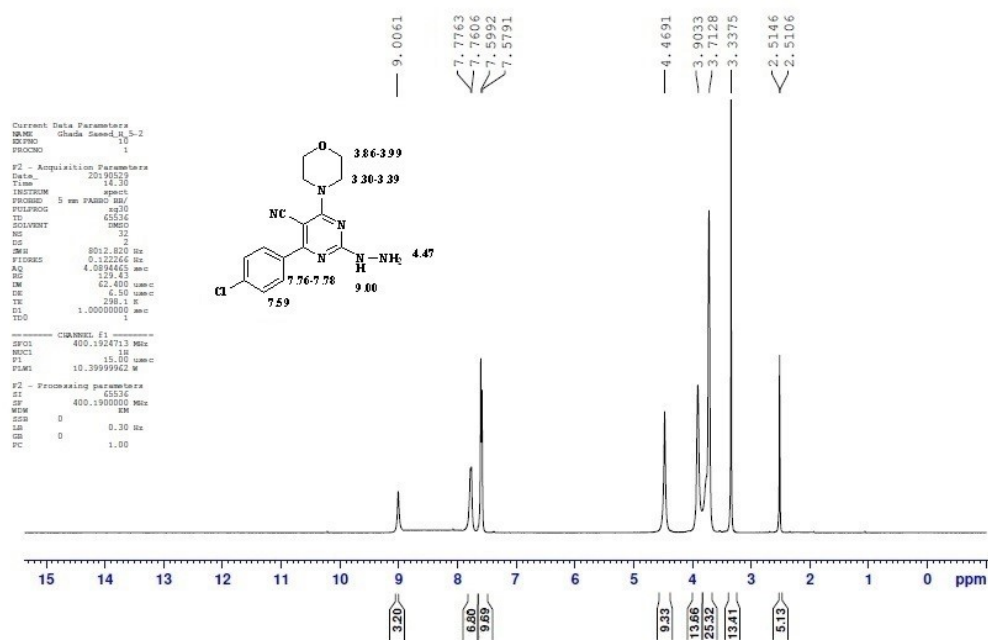


Spectral data of compound 5

The IR spectrum of compound 5



The ¹H NMR spectrum of compound 5

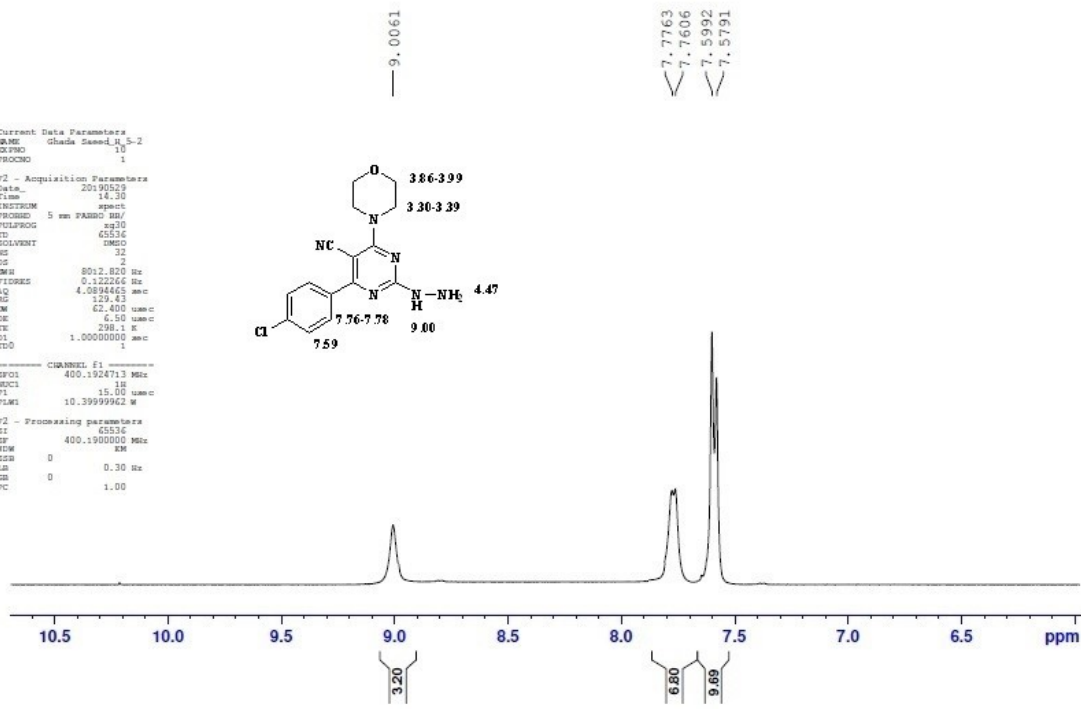
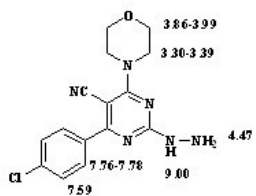


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 PROCNO 1

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 PULPROG zg30
 TD 65536
 SOLVENT DMSO
 NS 32
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.122266 Hz
 AQ 4.0894865 sec
 RG 329.83
 DW 62.400 usec
 DE 6.50 usec
 TE 298.1 K
 D1 1.0000000 sec
 TDO 1

----- CHANNEL f1 -----
 SFOL 400.1924713 MHz
 NUC1 1H
 P1 15.00 usec
 PLW1 10.39999962 W

F2 - Processing parameters
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 SF 400.1900000 MHz
 WFM EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



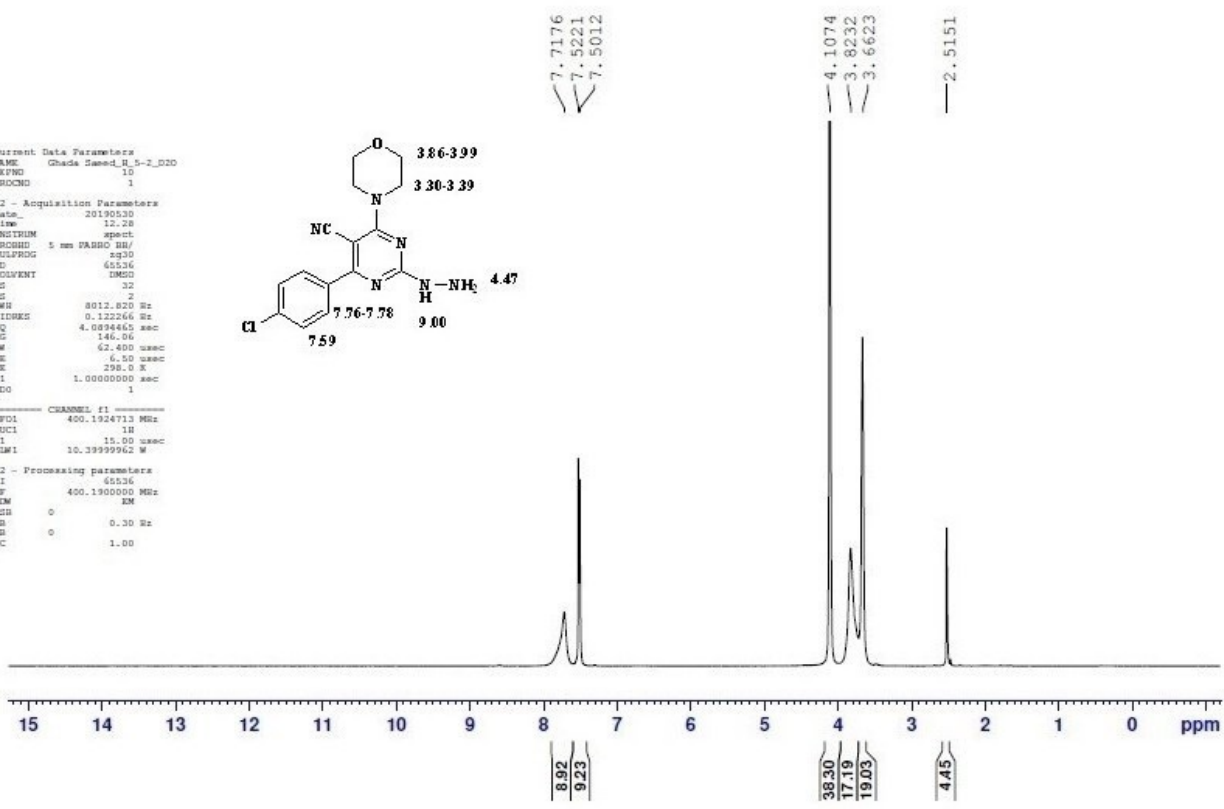
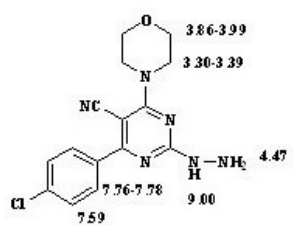
D2O

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 PROCNO 1

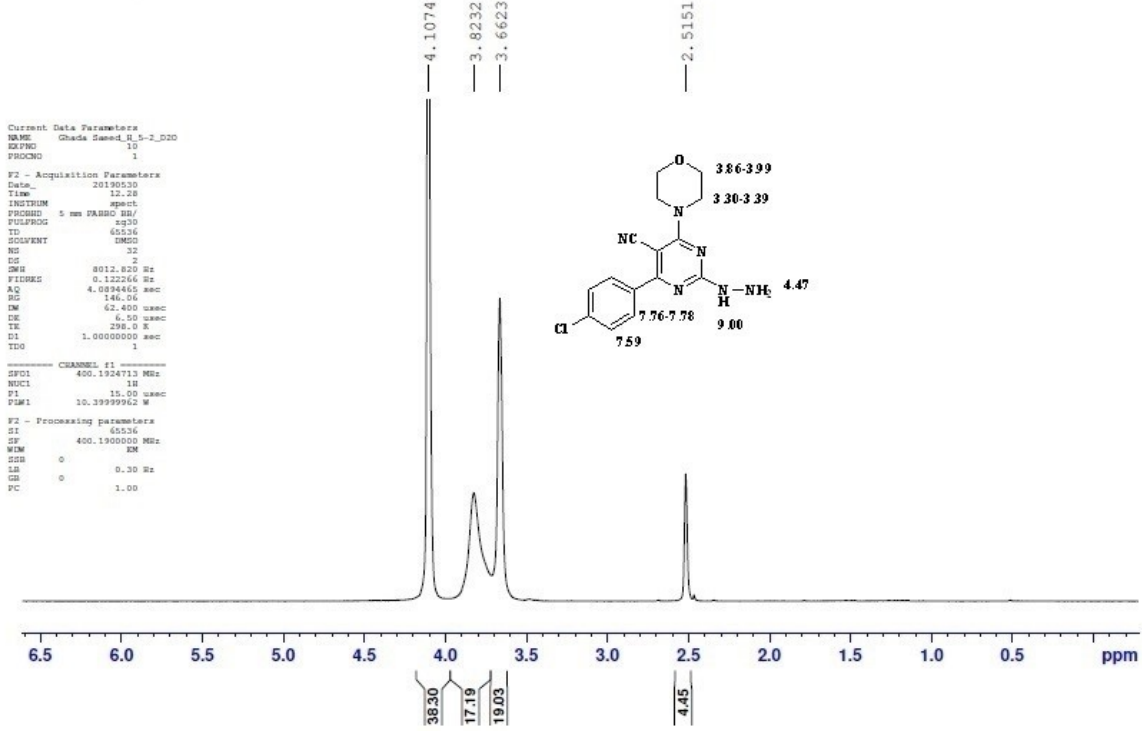
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 Time 13.28
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 PULPROG zg30
 TD 65536
 SOLVENT DMSO
 NS 32
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.122266 Hz
 AQ 4.0894865 sec
 RG 329.83
 DW 62.400 usec
 DE 6.50 usec
 TE 298.0 K
 D1 1.0000000 sec
 TDO 1

----- CHANNEL f1 -----
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 NUC1 1H
 P1 15.00 usec
 PLW1 10.39999962 W

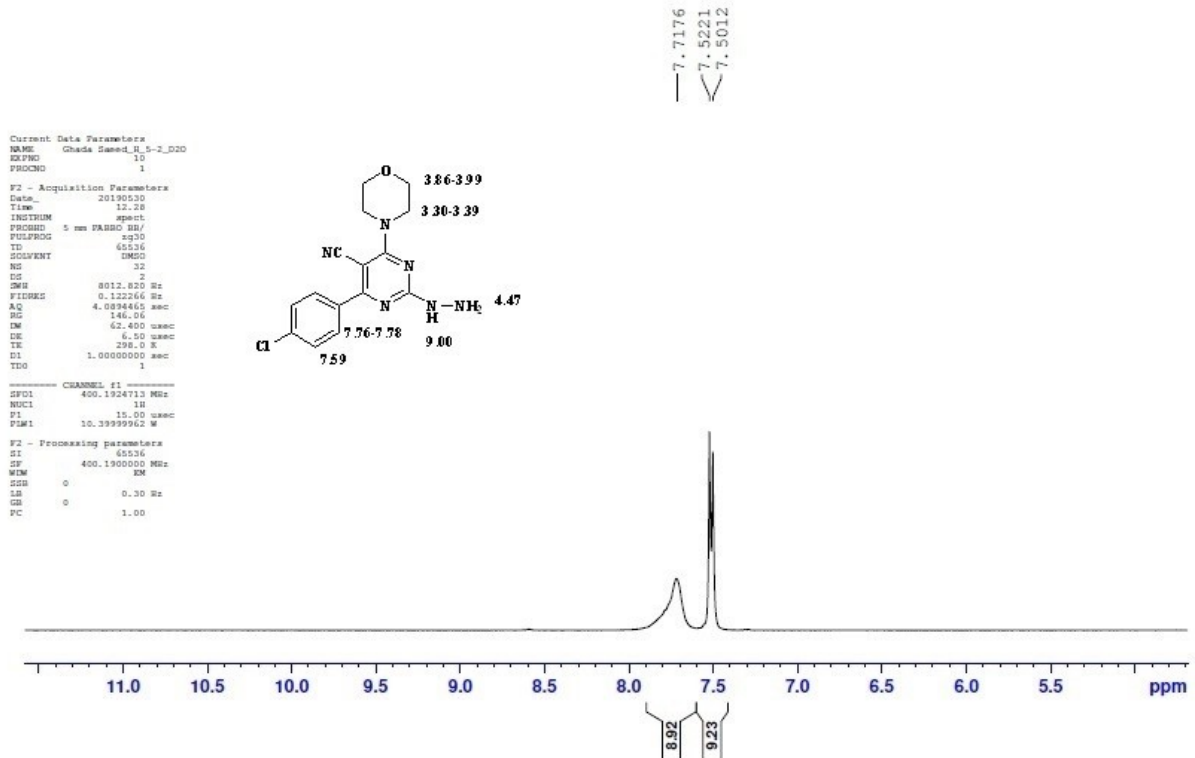
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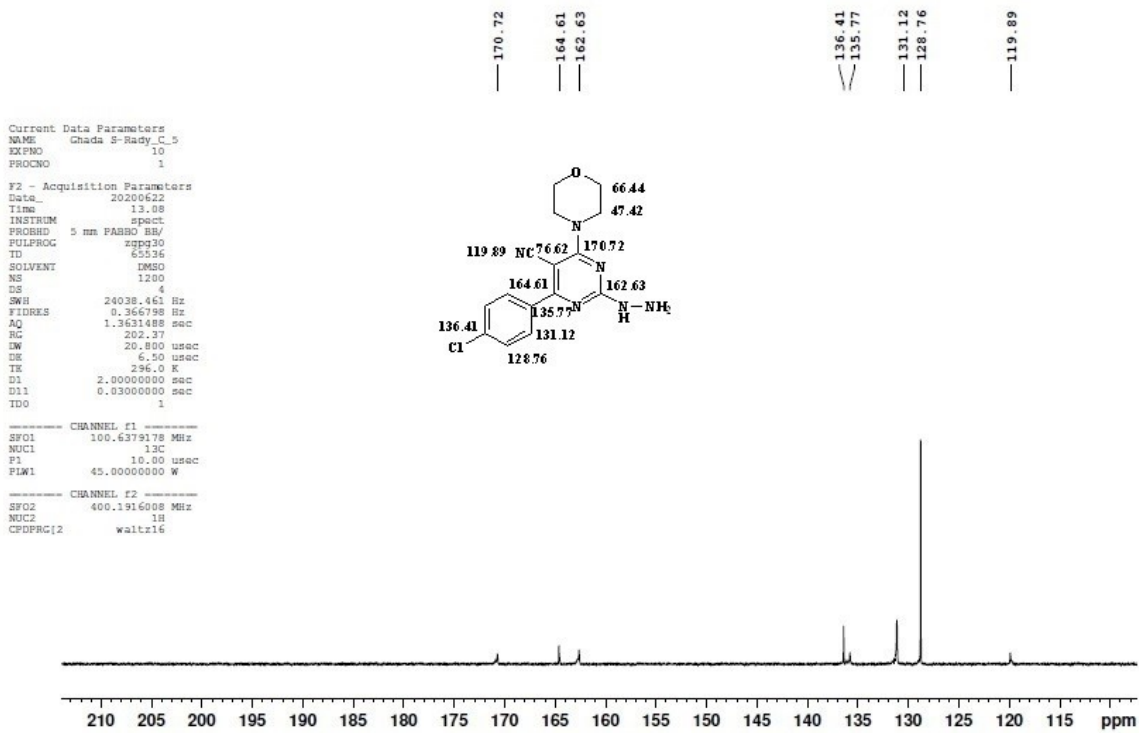
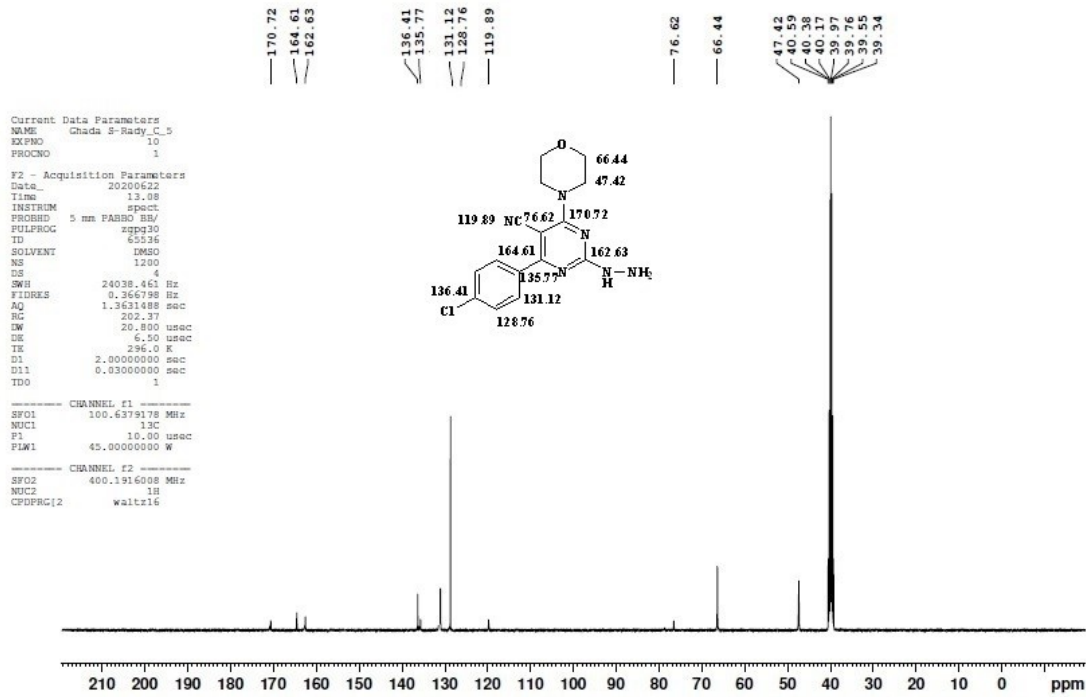
D2O



D2O

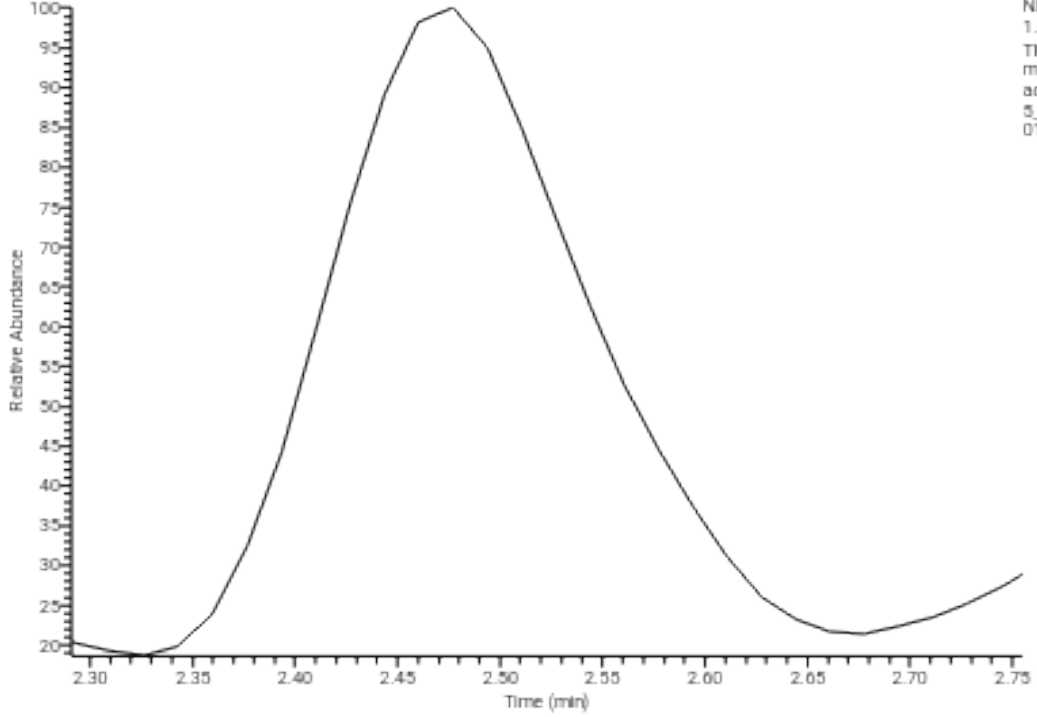


The ¹³C NMR spectrum of compound 5

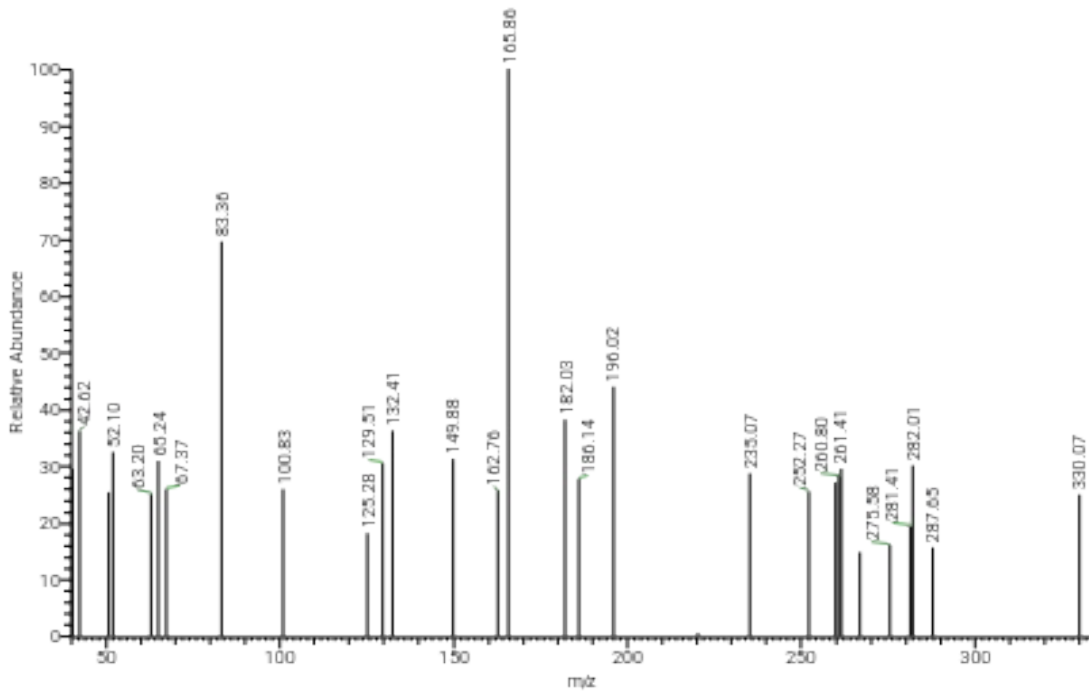


The mass spectrum of compound 5

RT: 2.29 - 2.75 SM: 15G

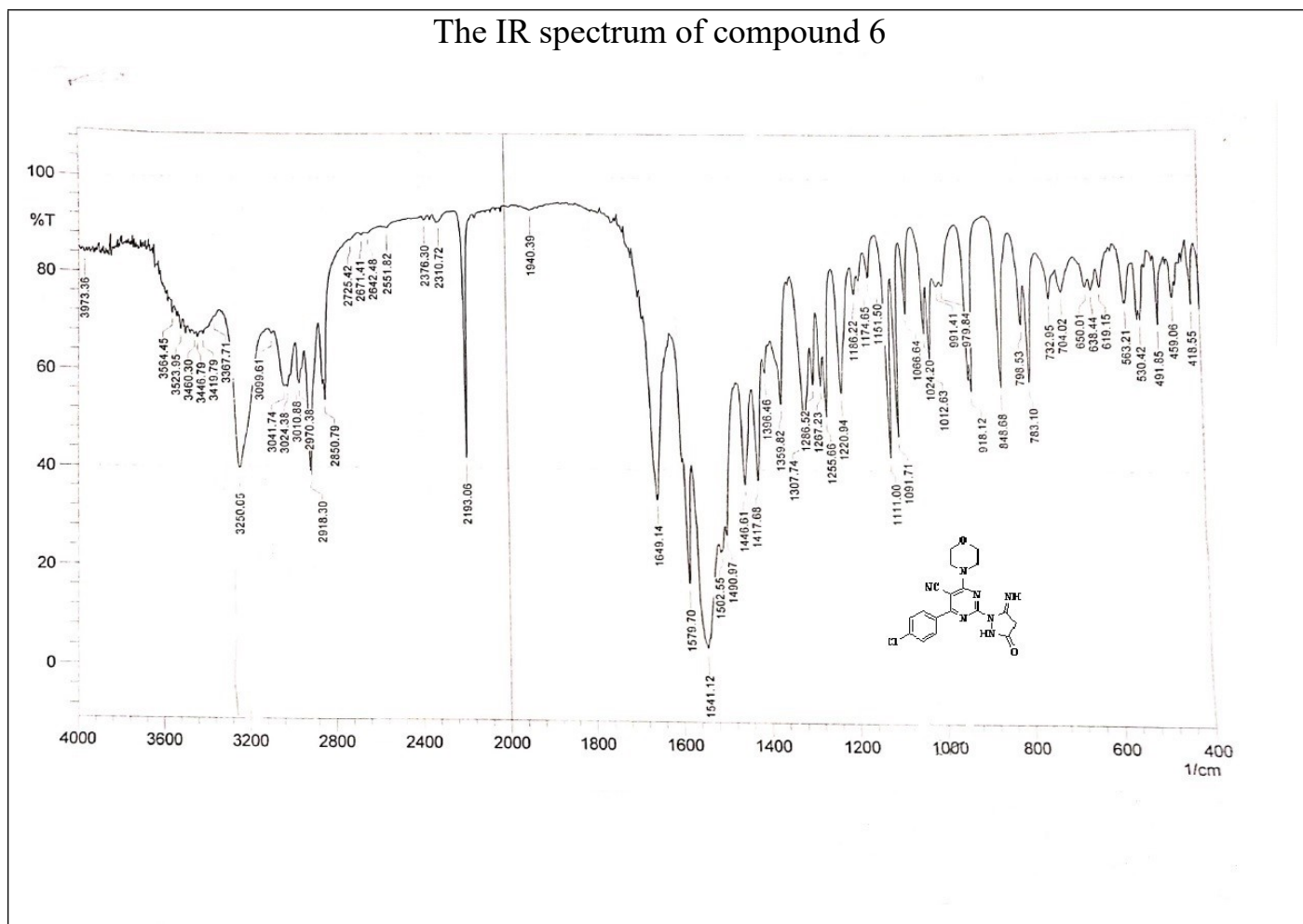


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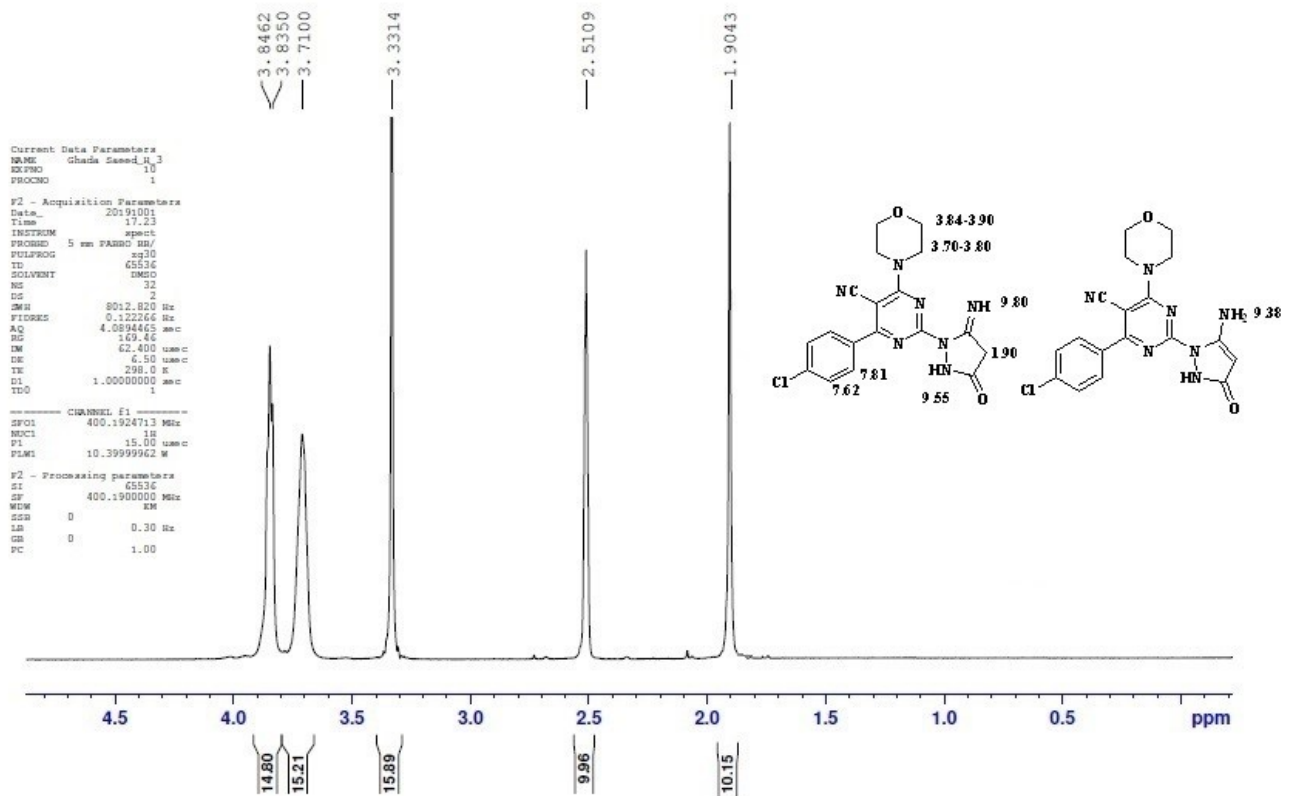
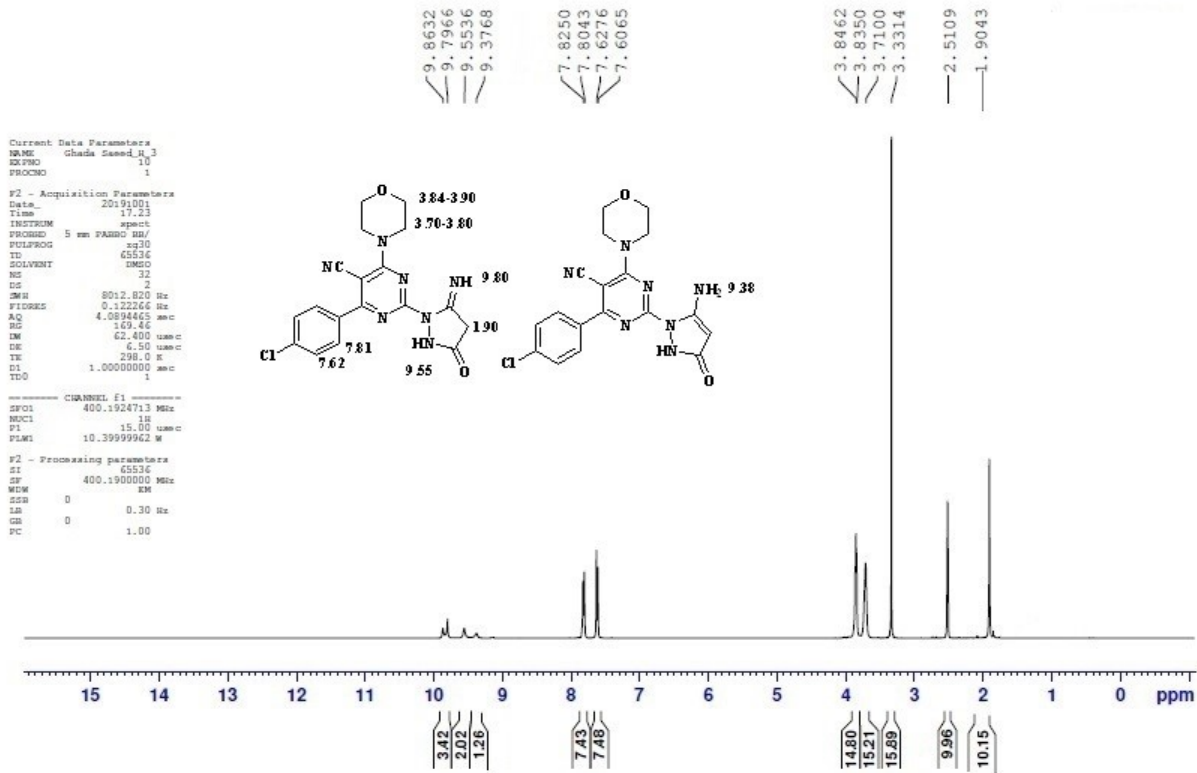


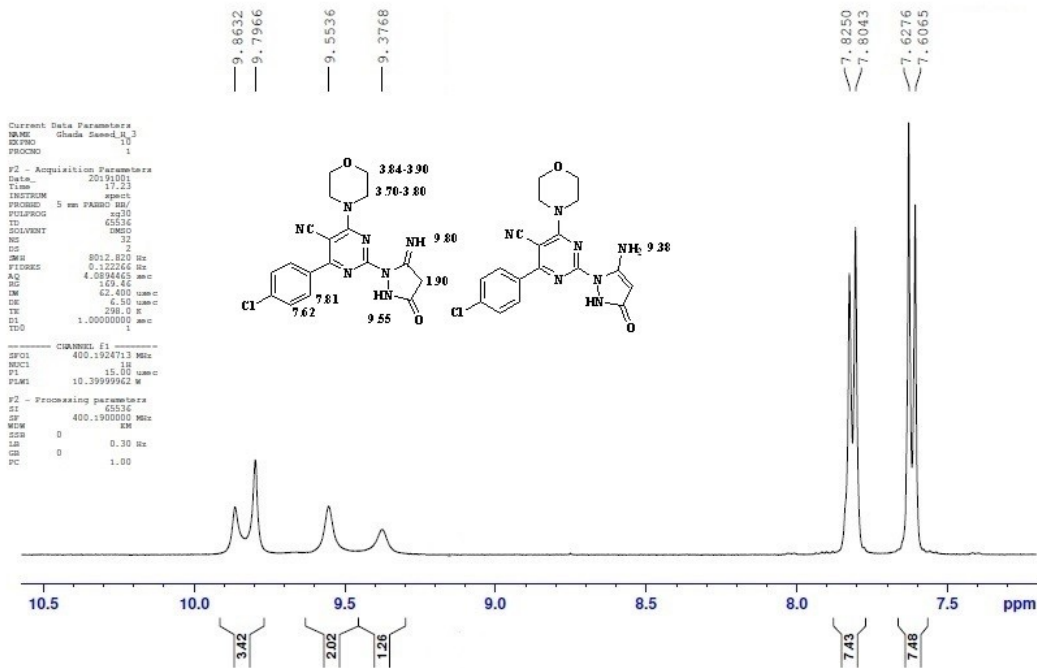
Spectral data of compound 6

The IR spectrum of compound 6

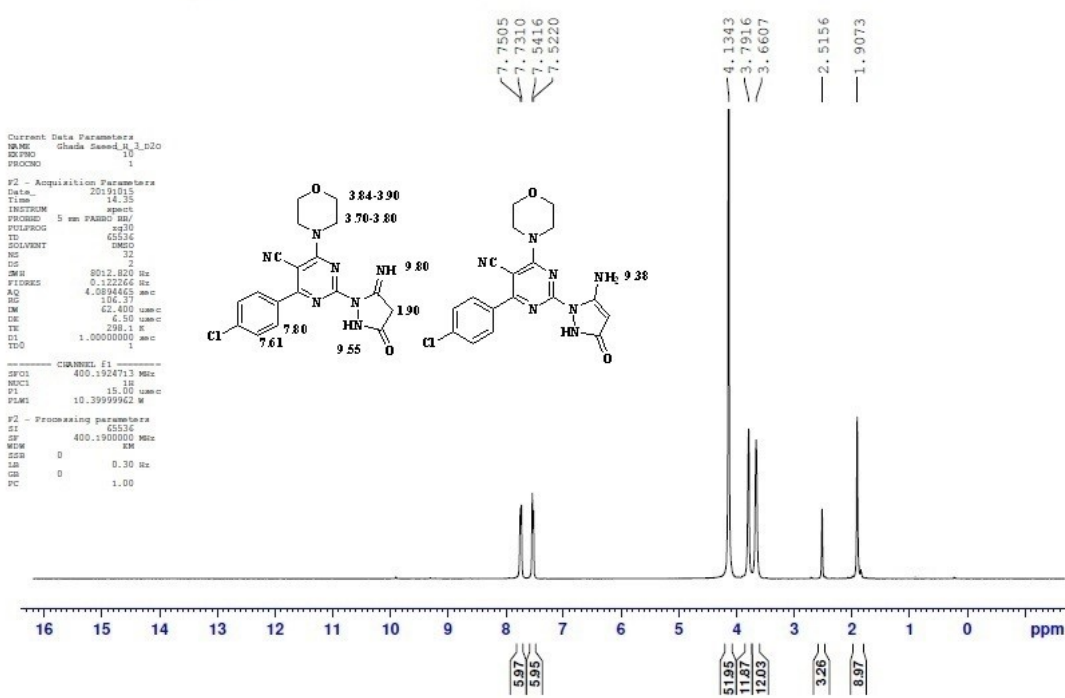


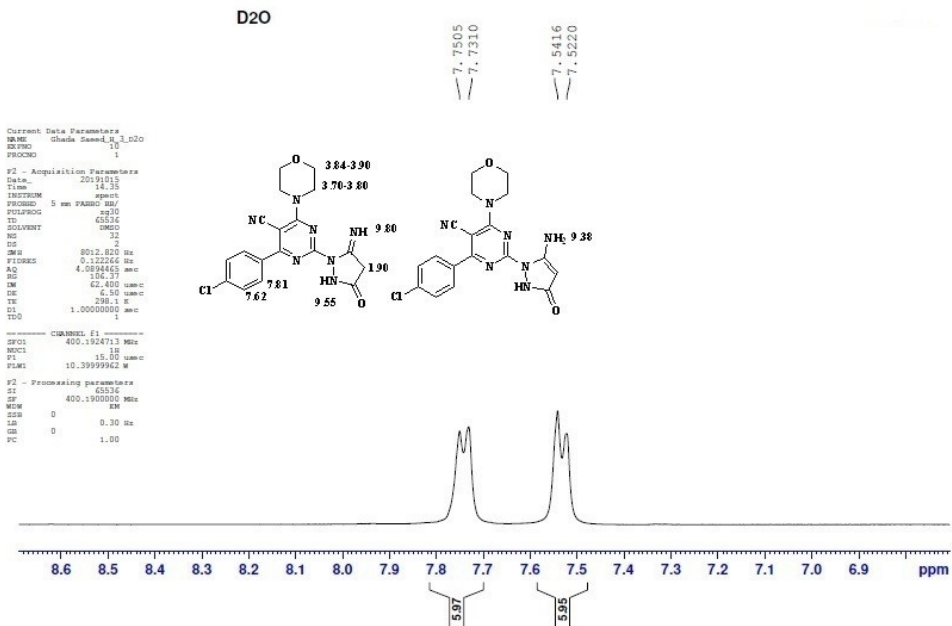
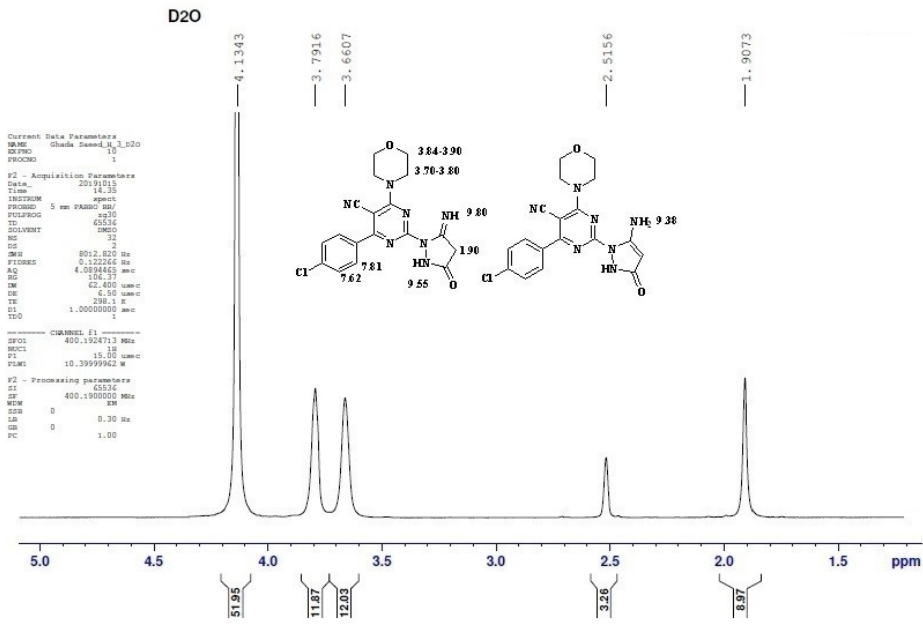
The ¹H NMR spectrum of compound 6



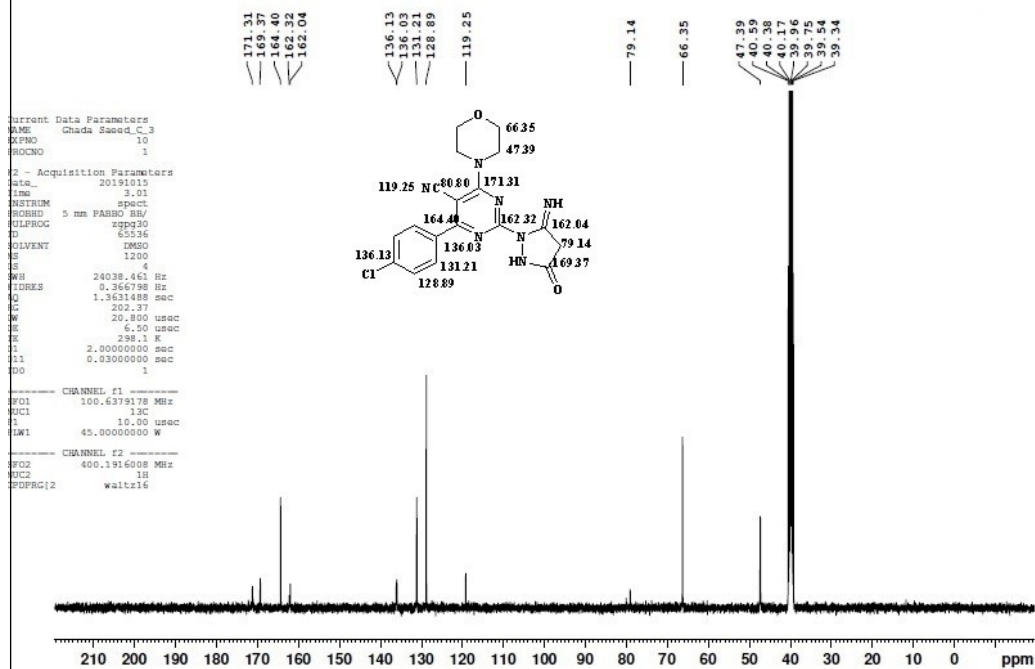
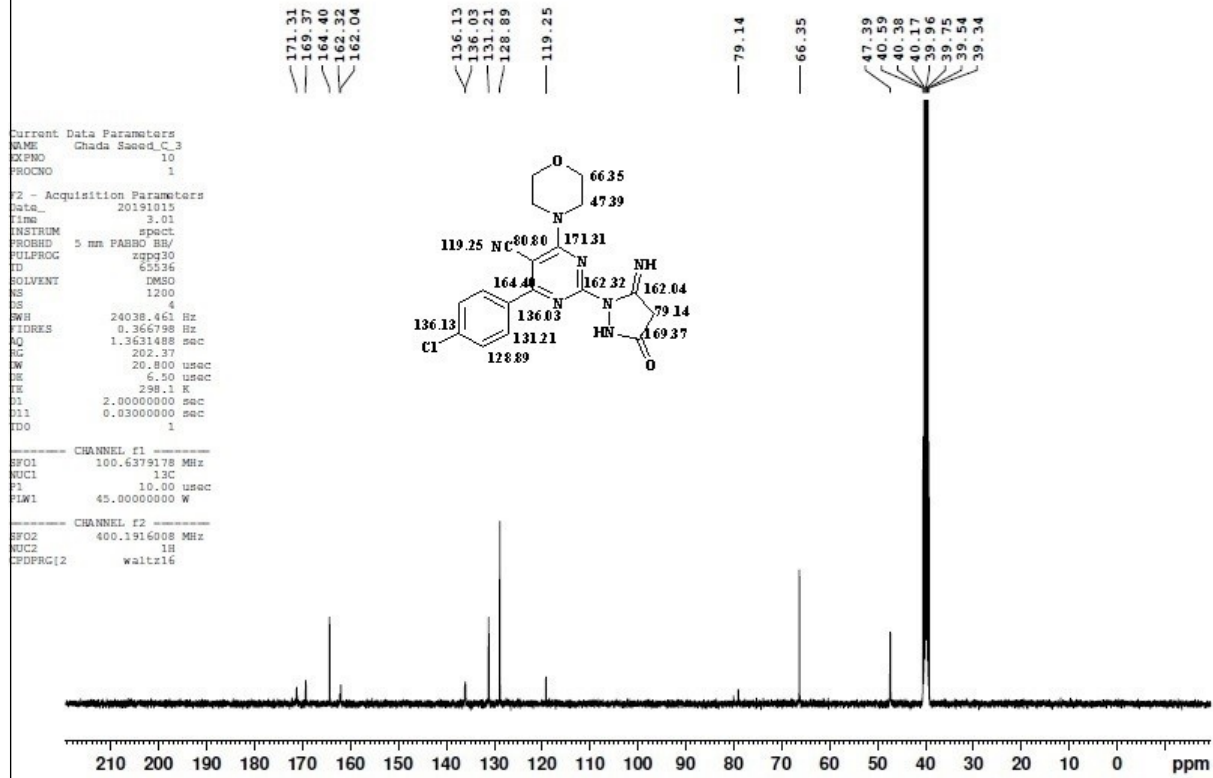


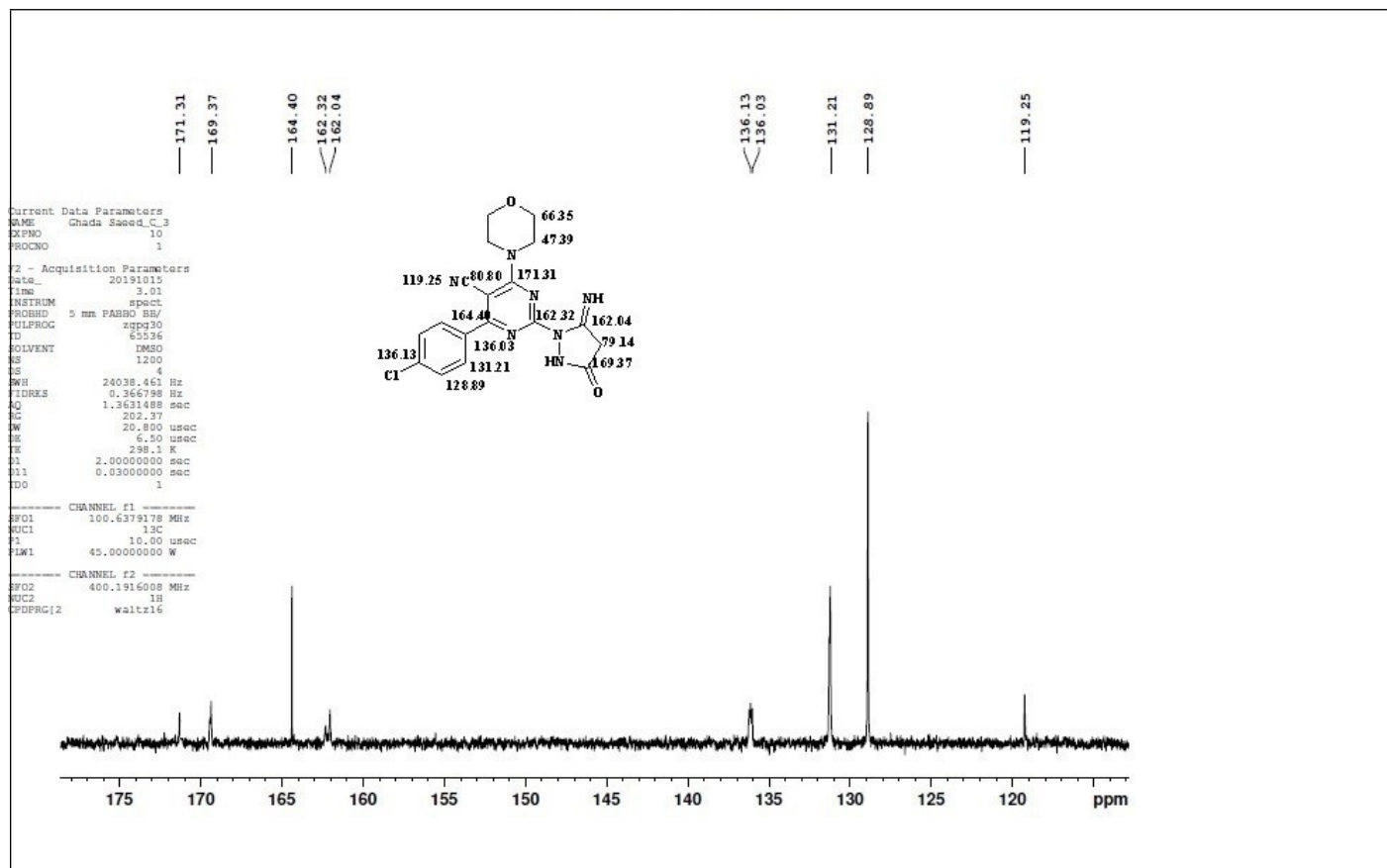
D2O



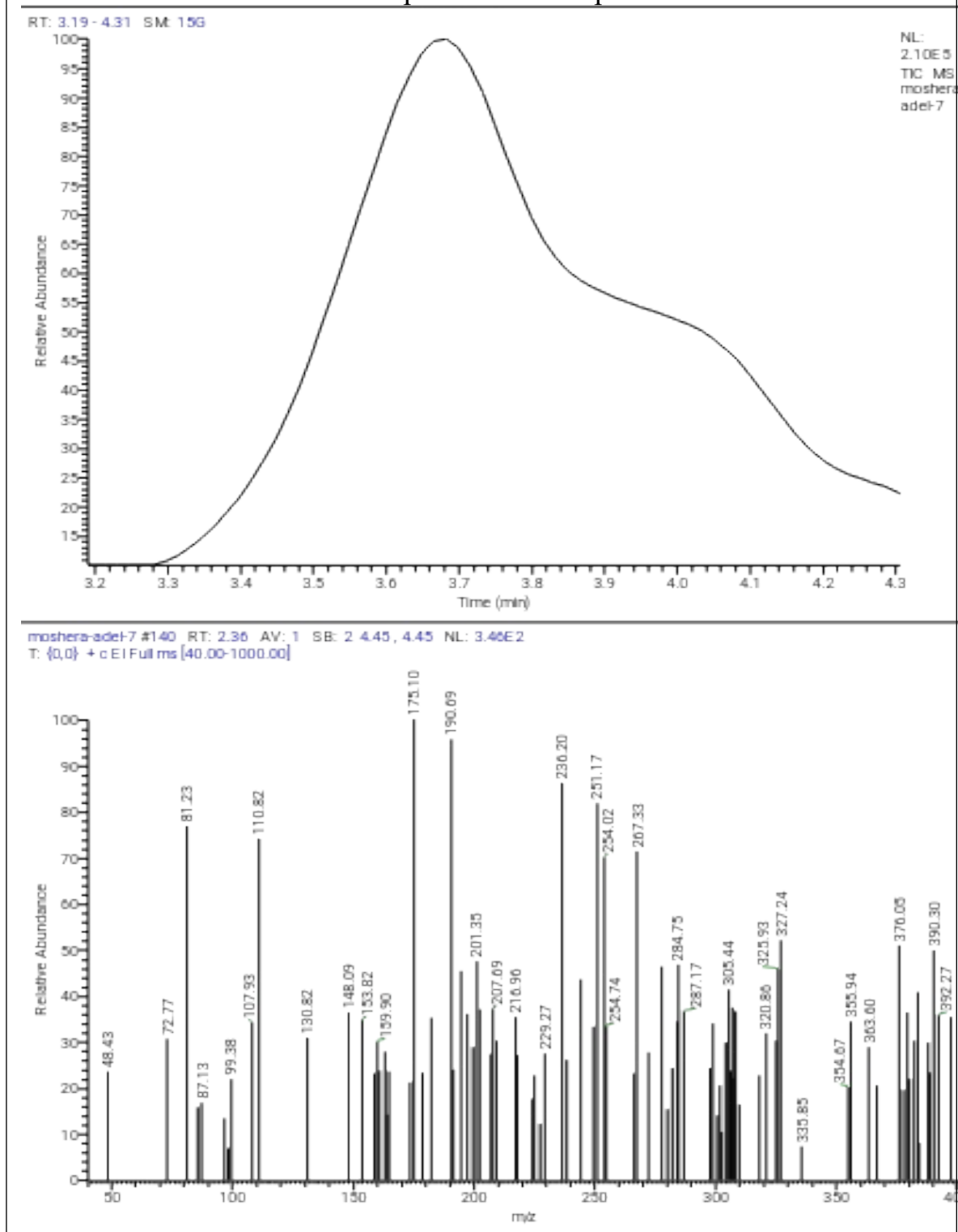


The ¹³C NMR spectrum of compound 6



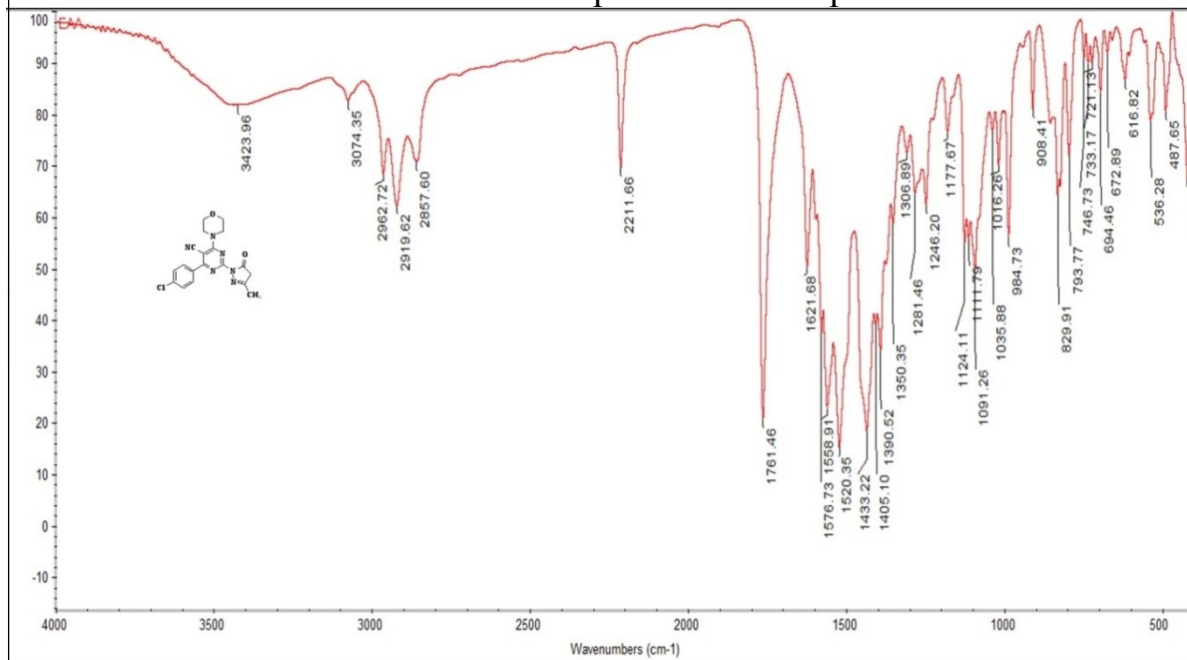


The mass spectrum of compound 6

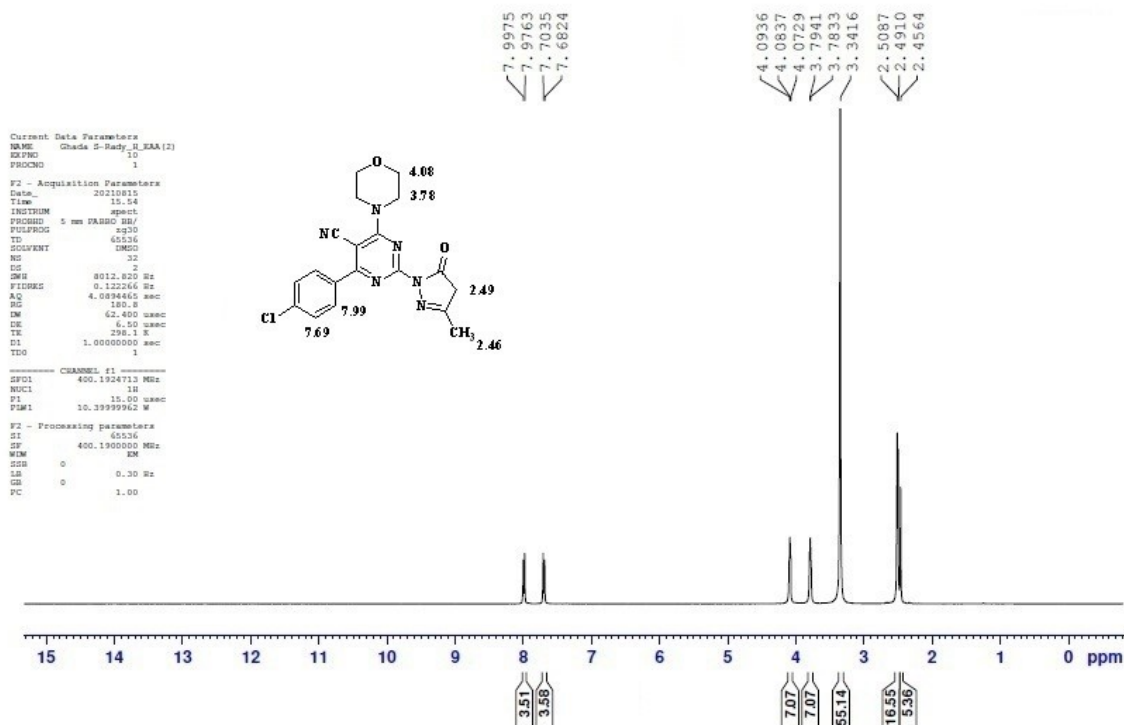


Spectral data of compound 7

The IR spectrum of compound 7



The ¹H NMR spectrum of compound 7

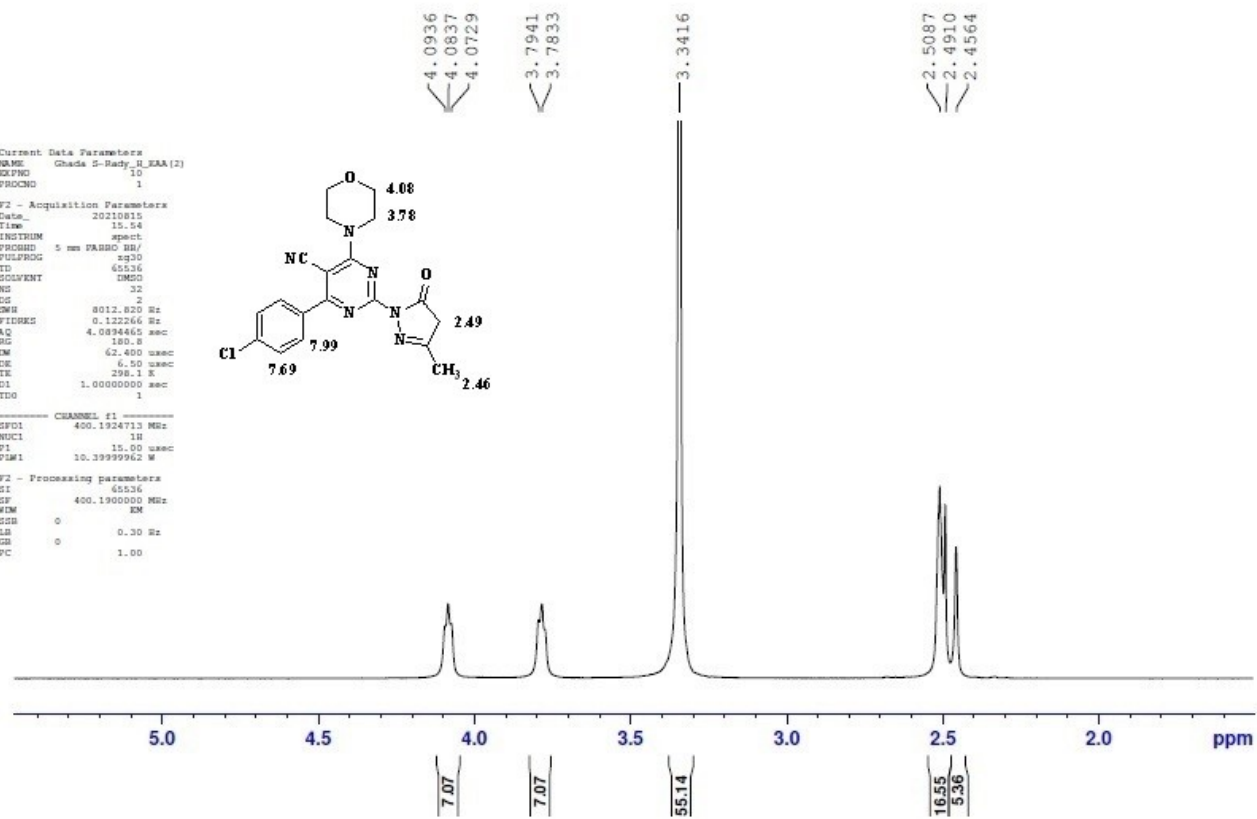
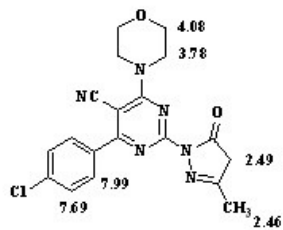


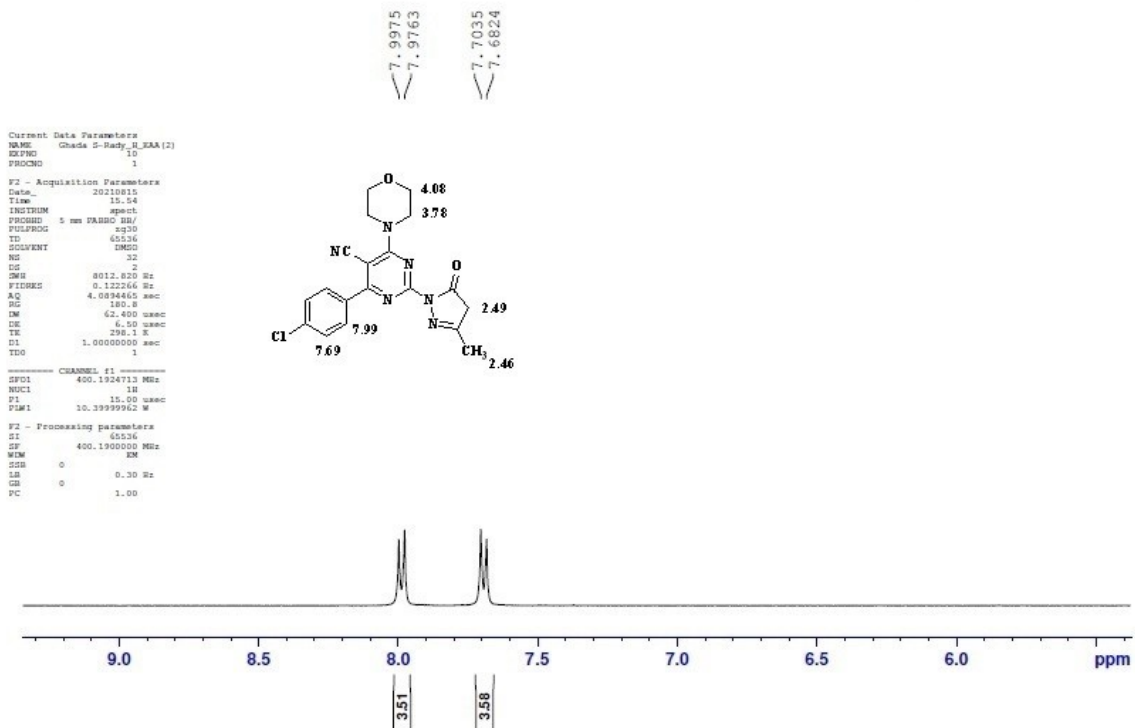
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 PULPROG: zg30
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 SOLVENT: DMSO
 NS: 32
 DS: 2
 SWH: 8012.820 Hz
 FIDRES: 0.122266 Hz
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 RG: 180.8
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 DE: 6.50 usec
 TE: 298.1 K
 D1: 1.0000000 sec
 TDO: 1

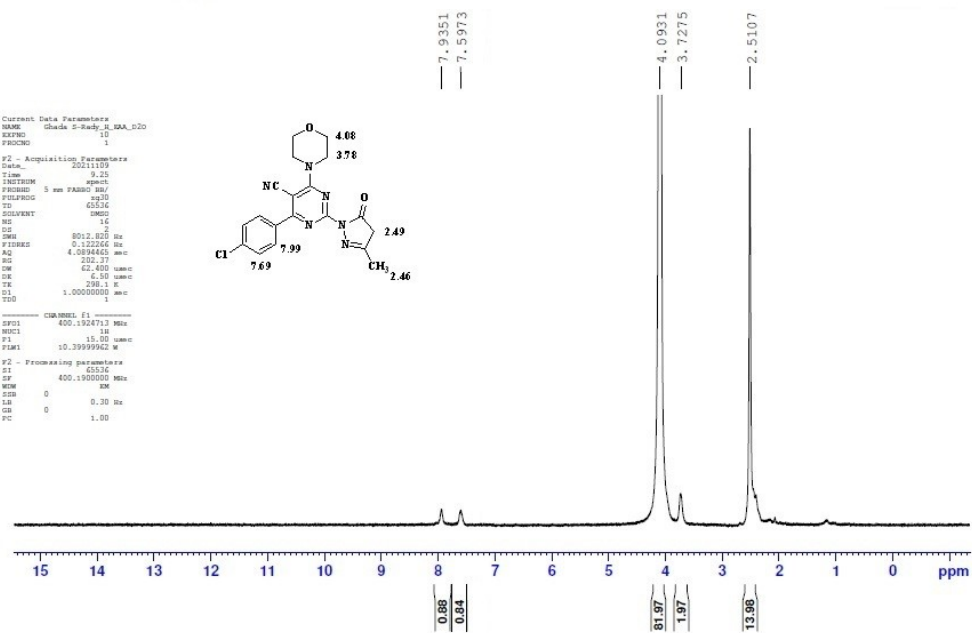
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 NUC1: 1H
 P1: 15.00 usec
 P1M1: 10.39999962 W

F2 - Processing parameters
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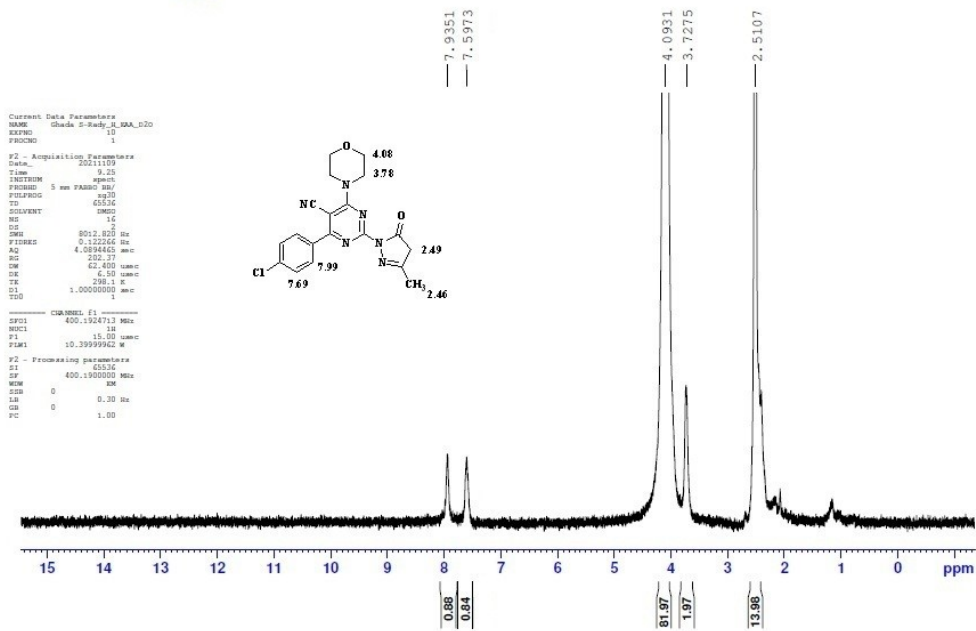




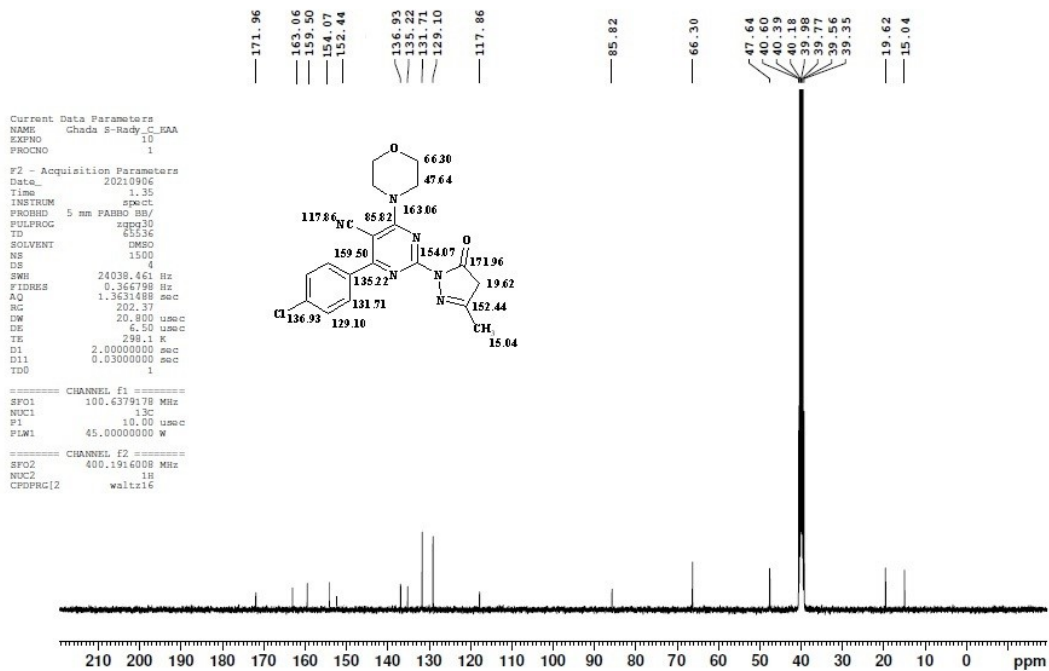
D2O

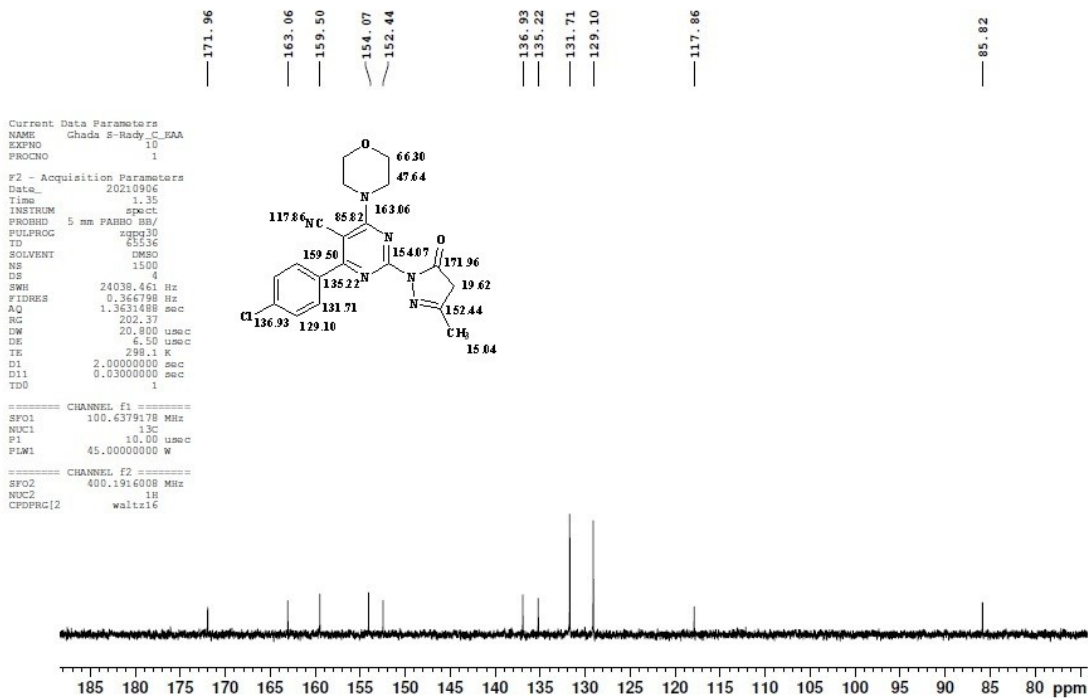
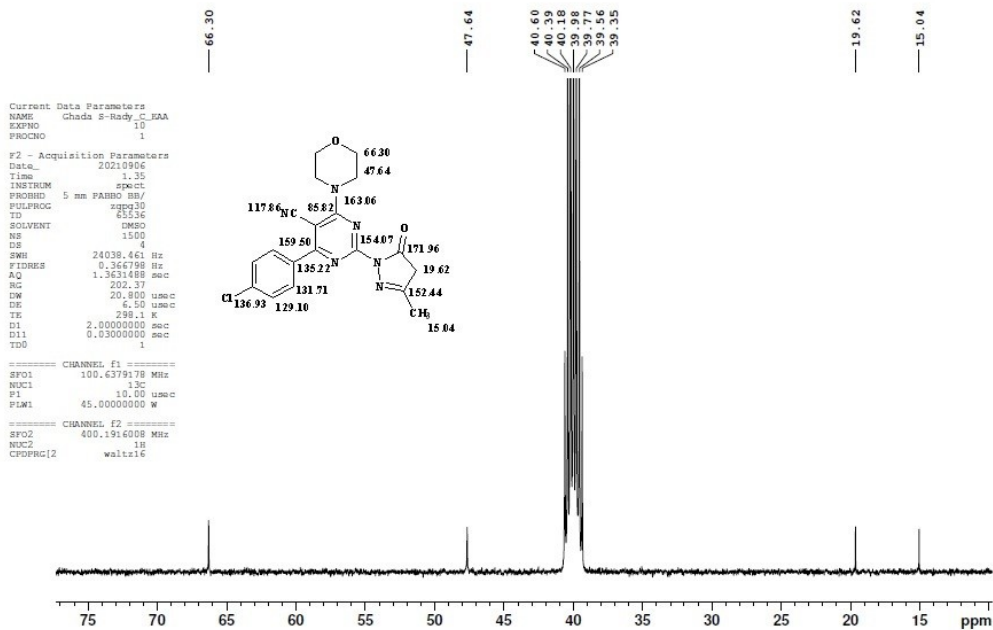


D2O

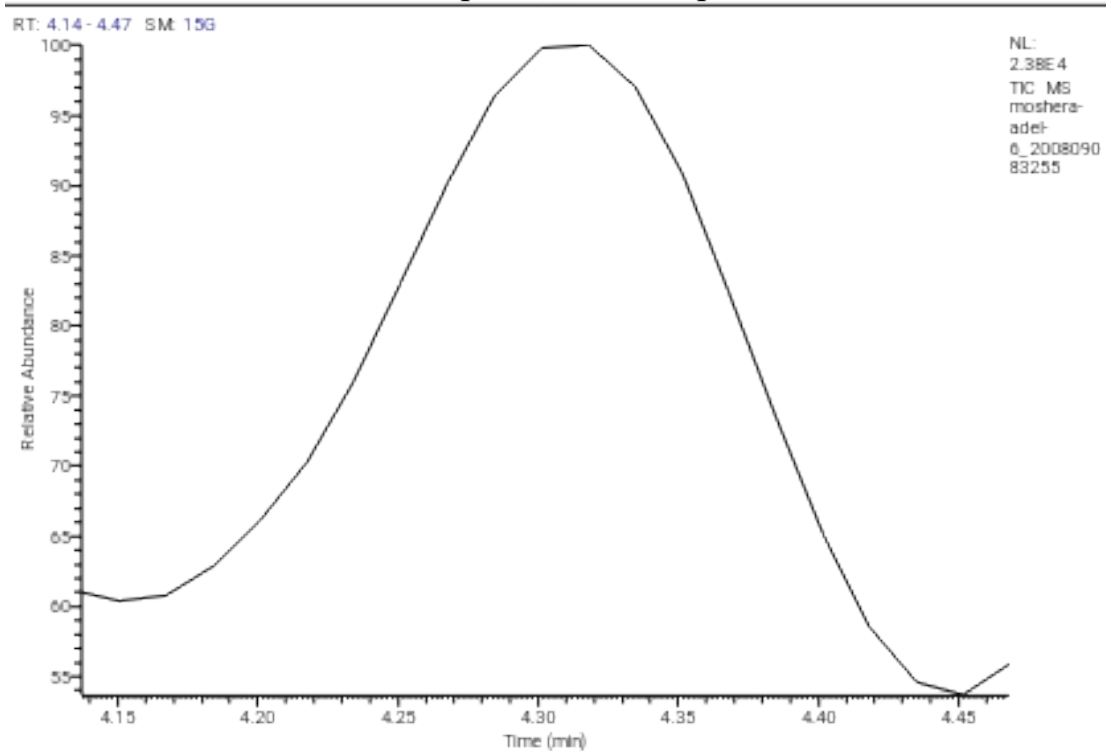


The ¹³C NMR spectrum of compound 7

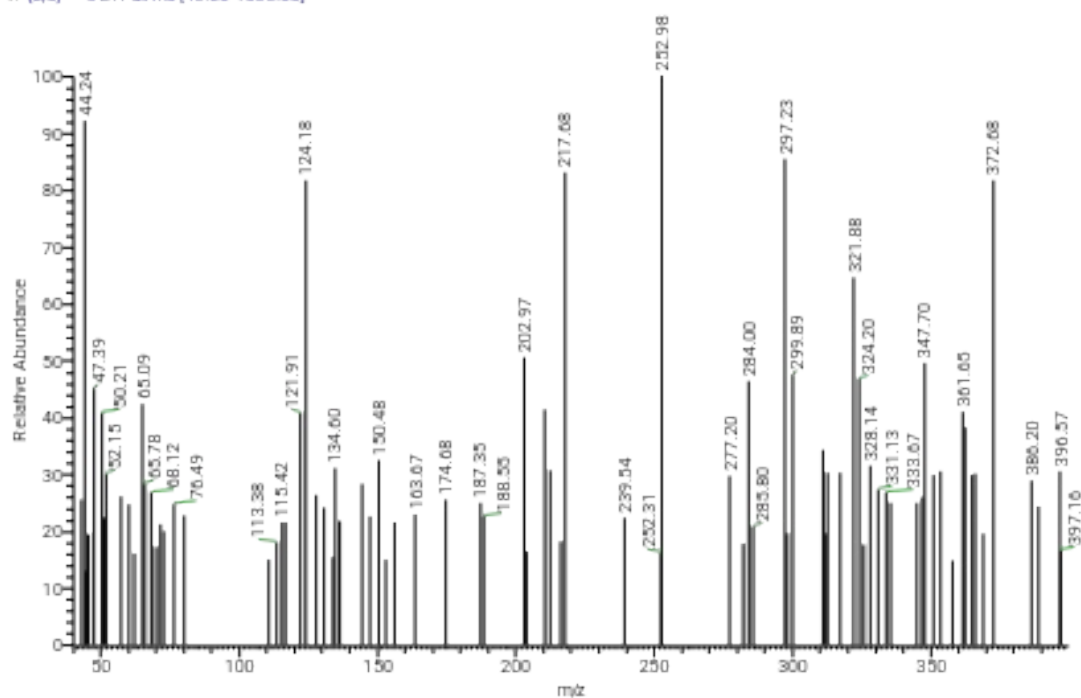




The mass spectrum of compound 7

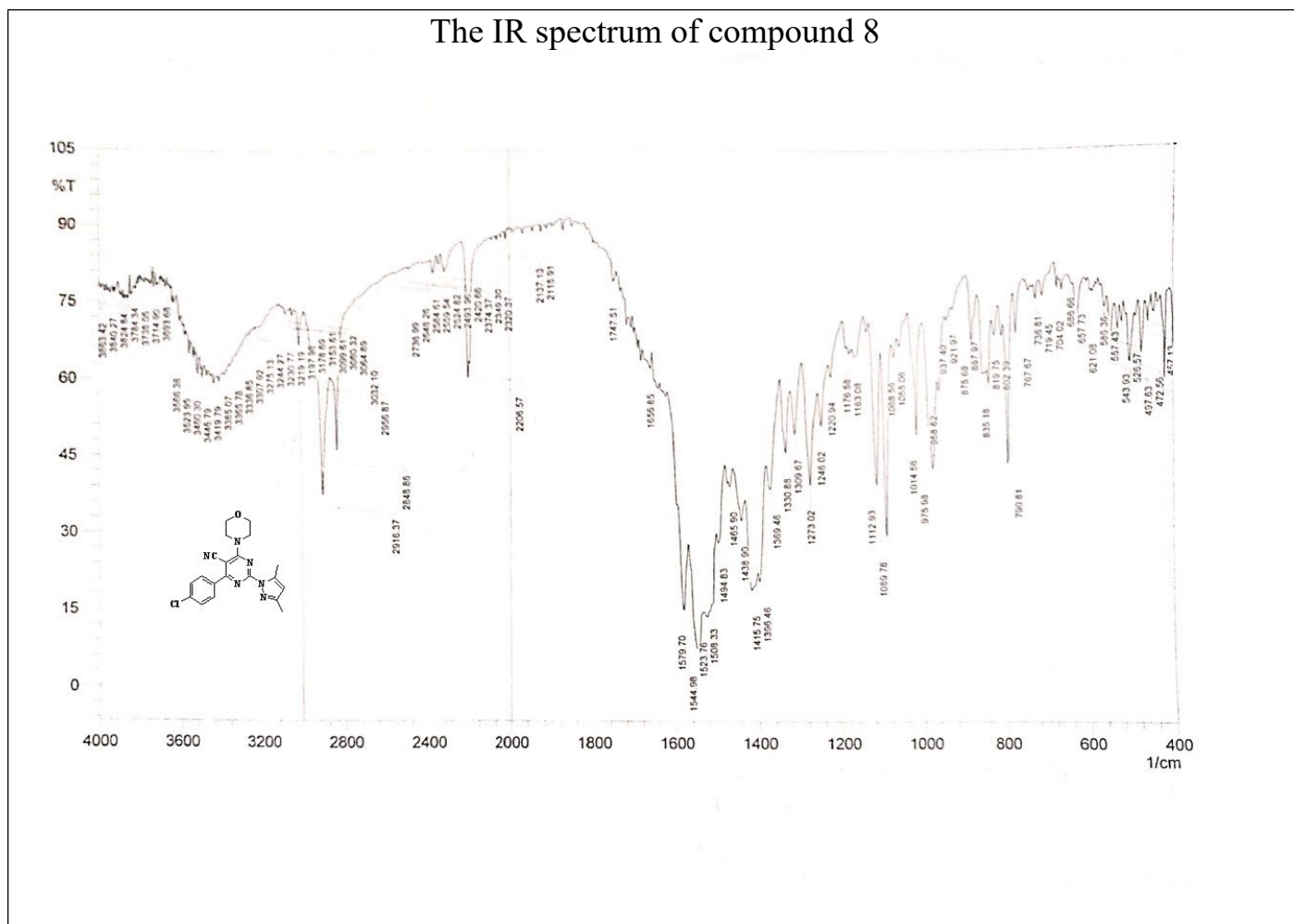


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Spectral data of compound 8

The IR spectrum of compound 8



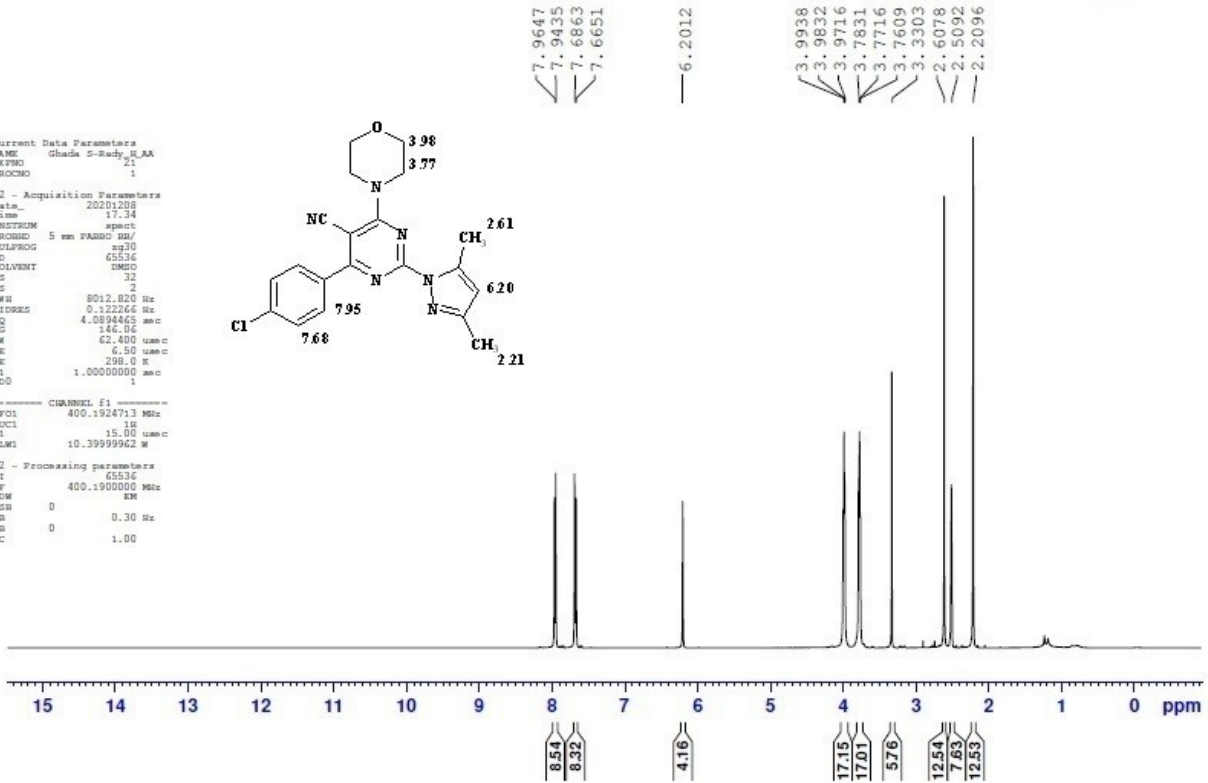
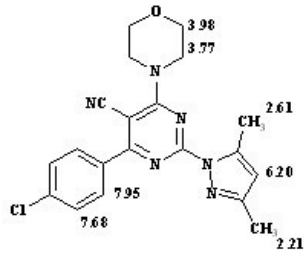
The ¹H NMR spectrum of compound 8

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 PROCNO 1

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 PULPROG zg30
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 SOLVENT DMSO
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 DS 2
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 FIDRES 0.122266 Hz
 AQ 4.0894465 sec
 RG 146.06
 DM 62.400 usec
 DE 4.50 usec
 TE 298.0 K
 D1 1.0000000 sec
 TDO 1

----- CHANNEL f1 -----
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 NUC1 1H
 P1 15.00 usec
 PLW1 10.39999962 W

F2 - Processing parameters
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 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

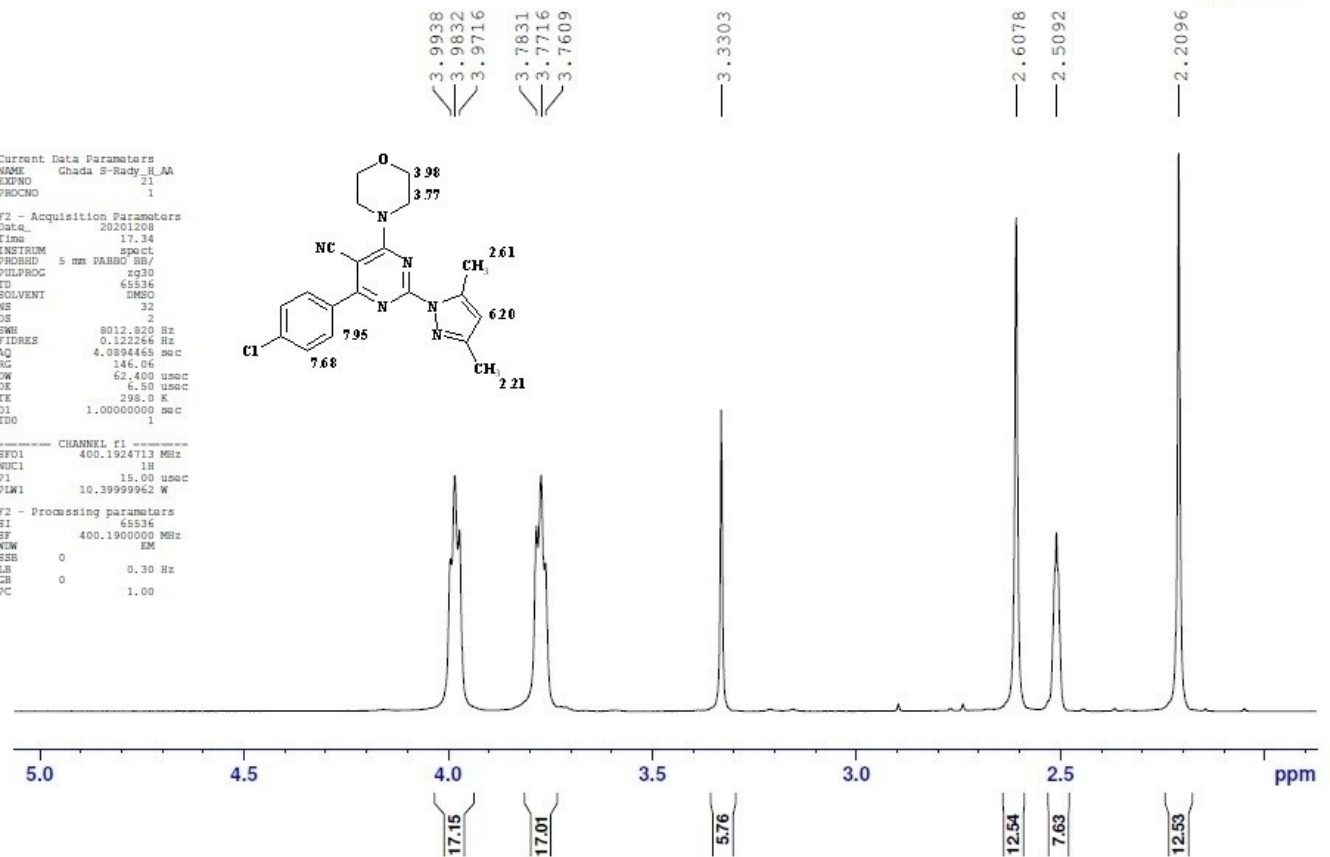
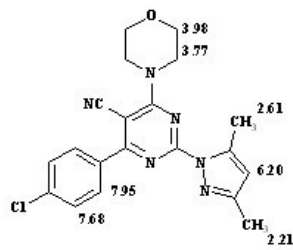


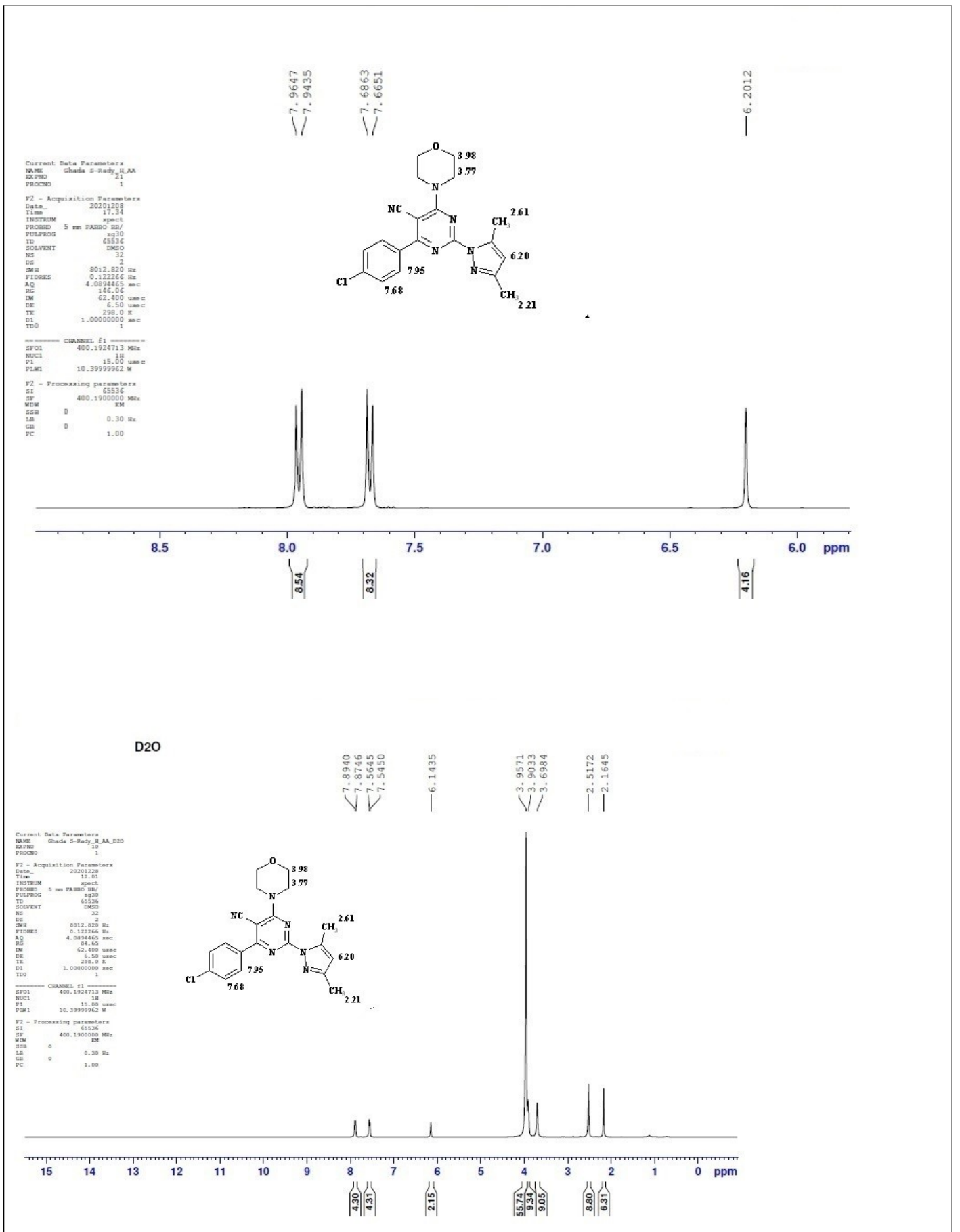
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 EXPNO 21
 PROCNO 1

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 Time 17.34
 INSTRUM spect
 PROBRD 5 mm PABBO BB/
 PULPROG zg30
 TD 65536
 SOLVENT DMSO
 NS 32
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.122266 Hz
 AQ 4.0894465 sec
 RG 146.06
 DM 62.400 usec
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 TE 298.0 K
 D1 1.0000000 sec
 TDO 1

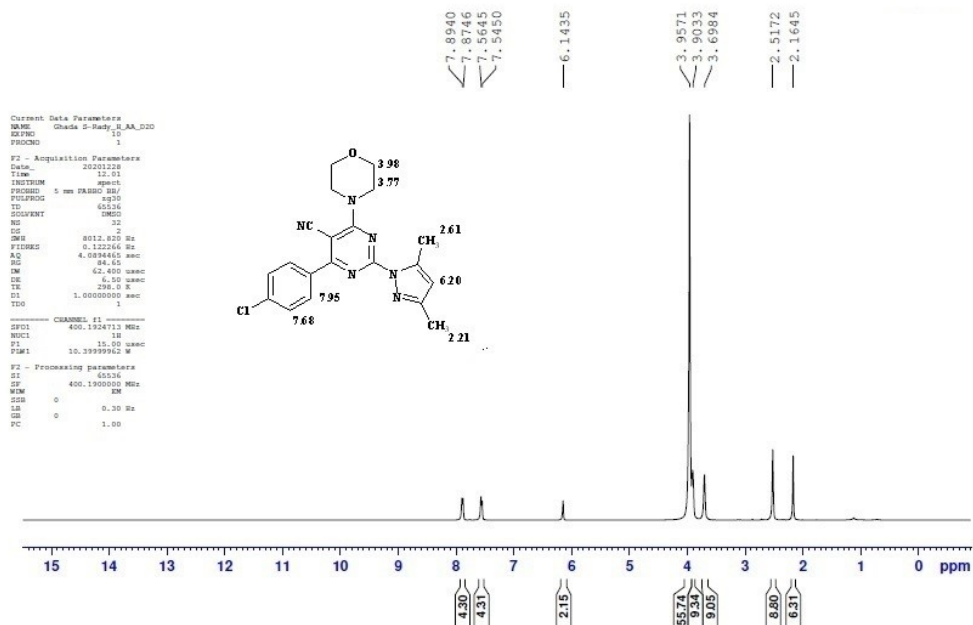
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 NUC1 1H
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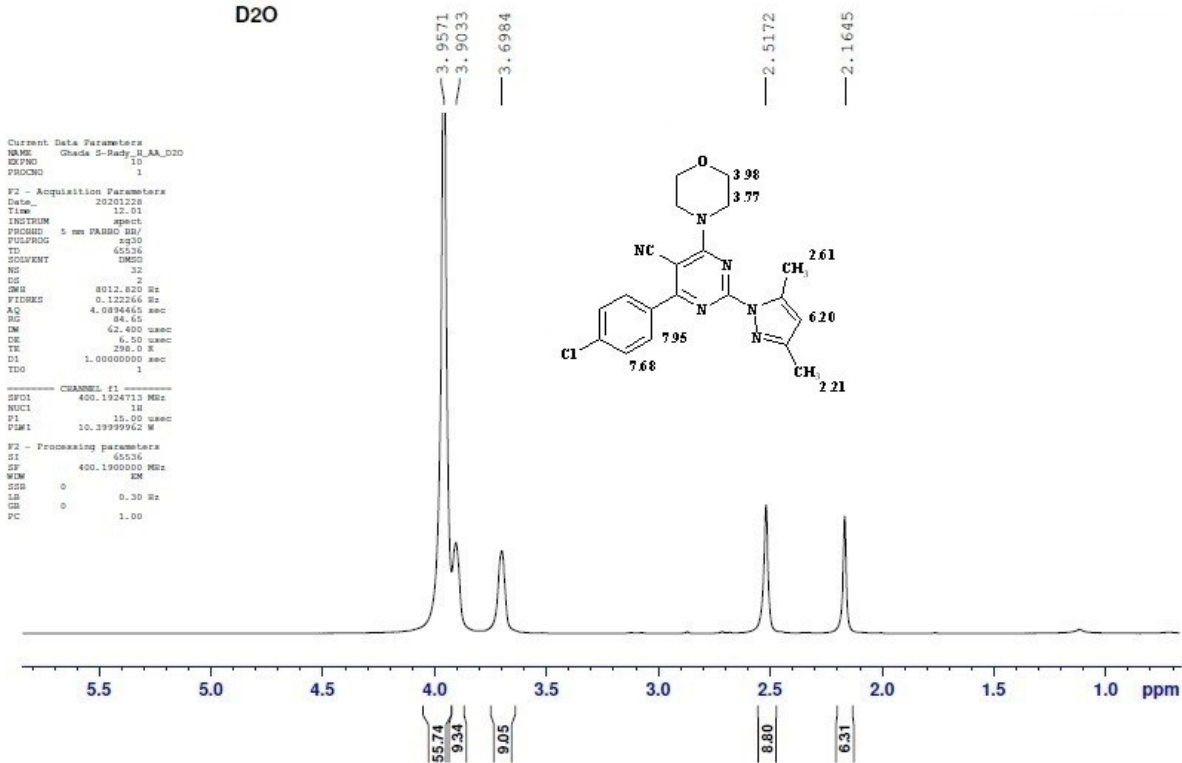


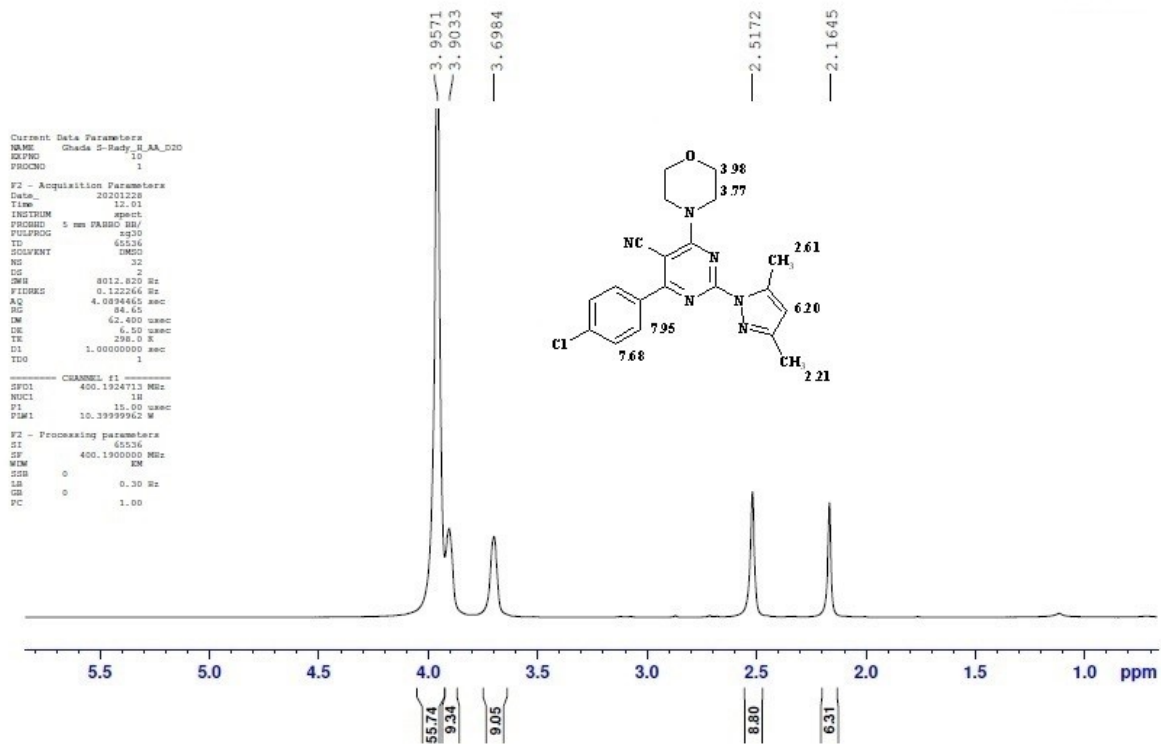


D₂O spectrum of compound 8

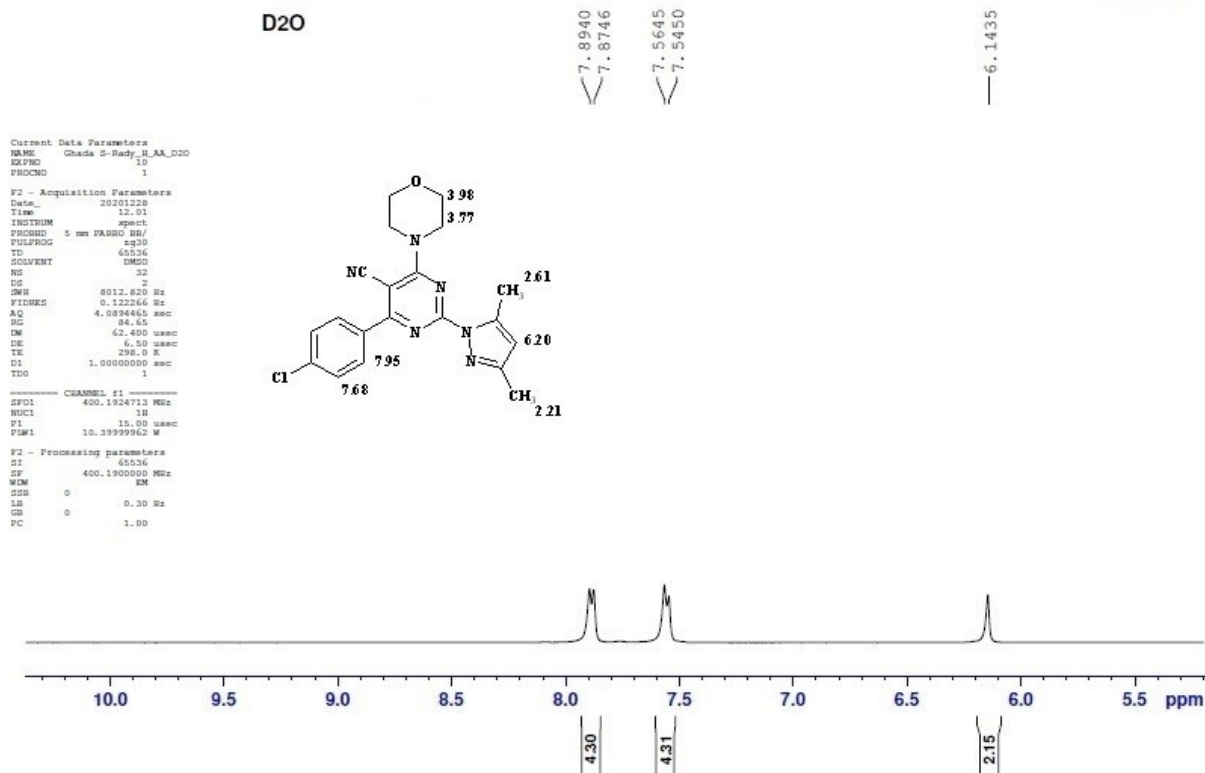


D2O

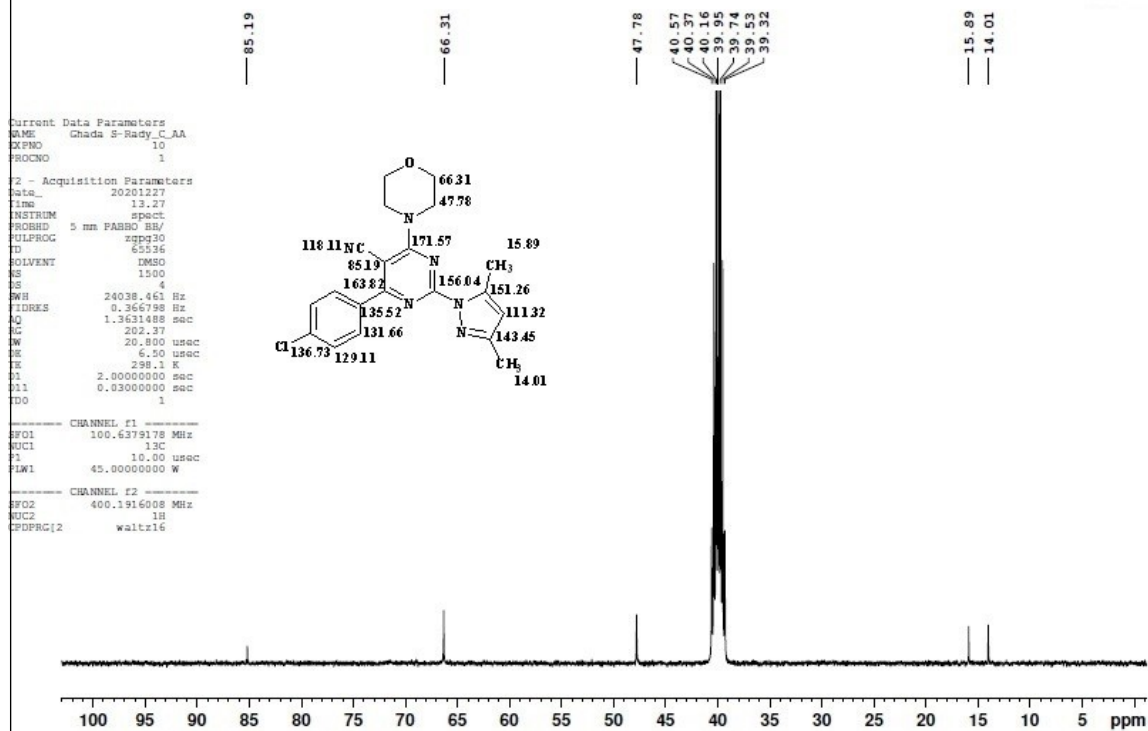
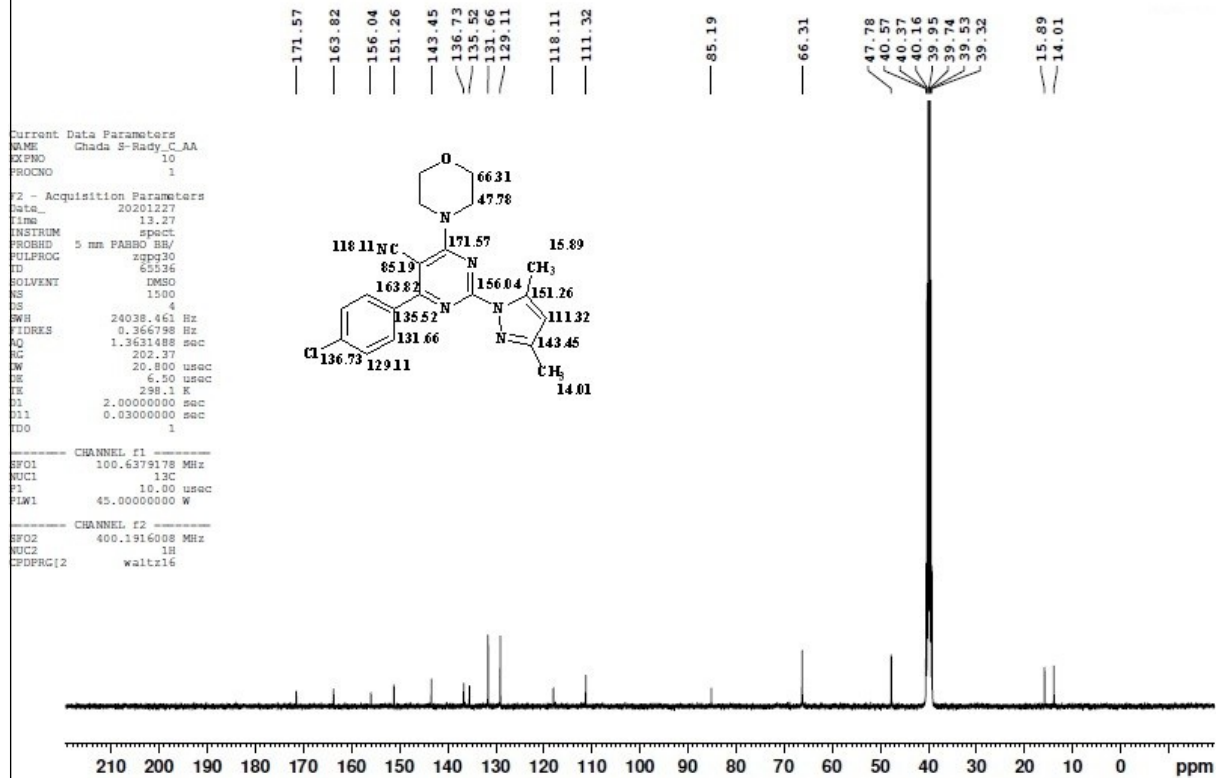


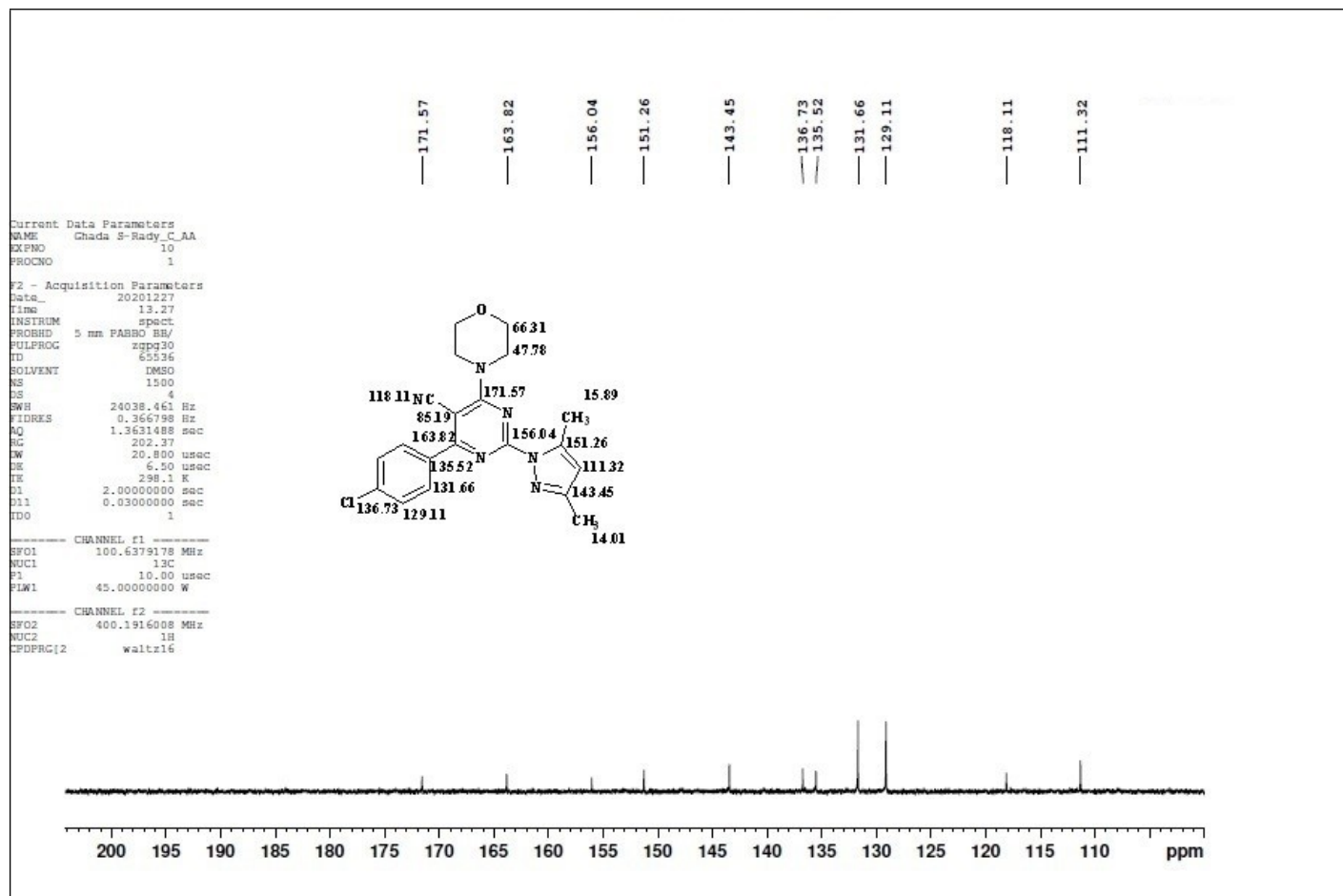


D2O

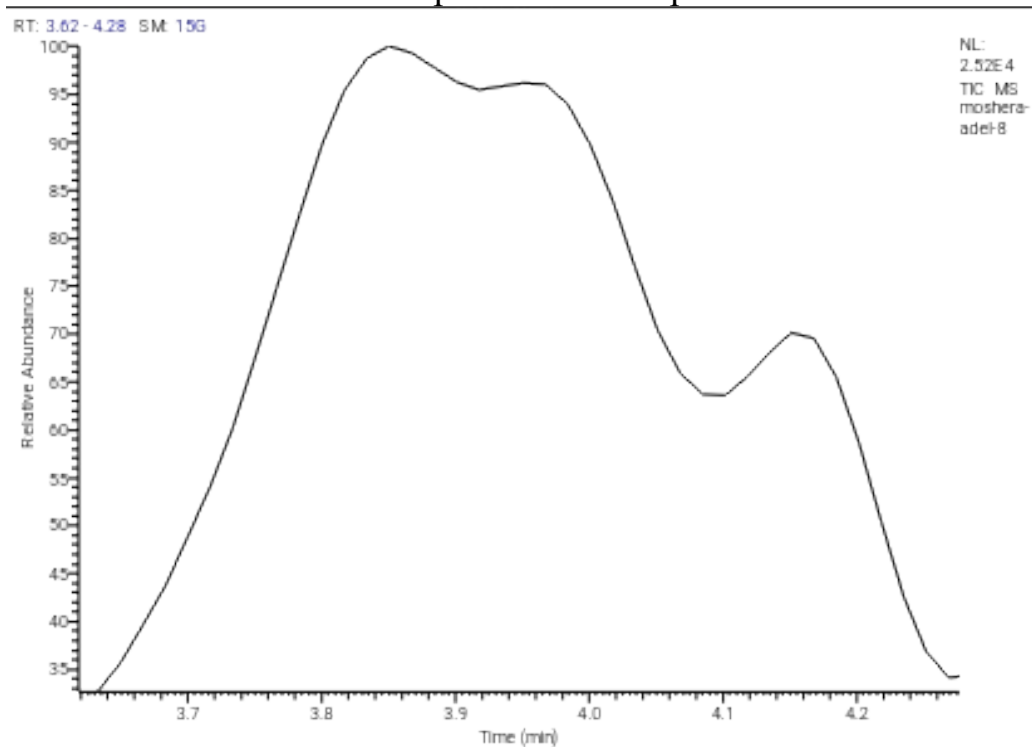


The ¹³C NMR spectrum of compound 8

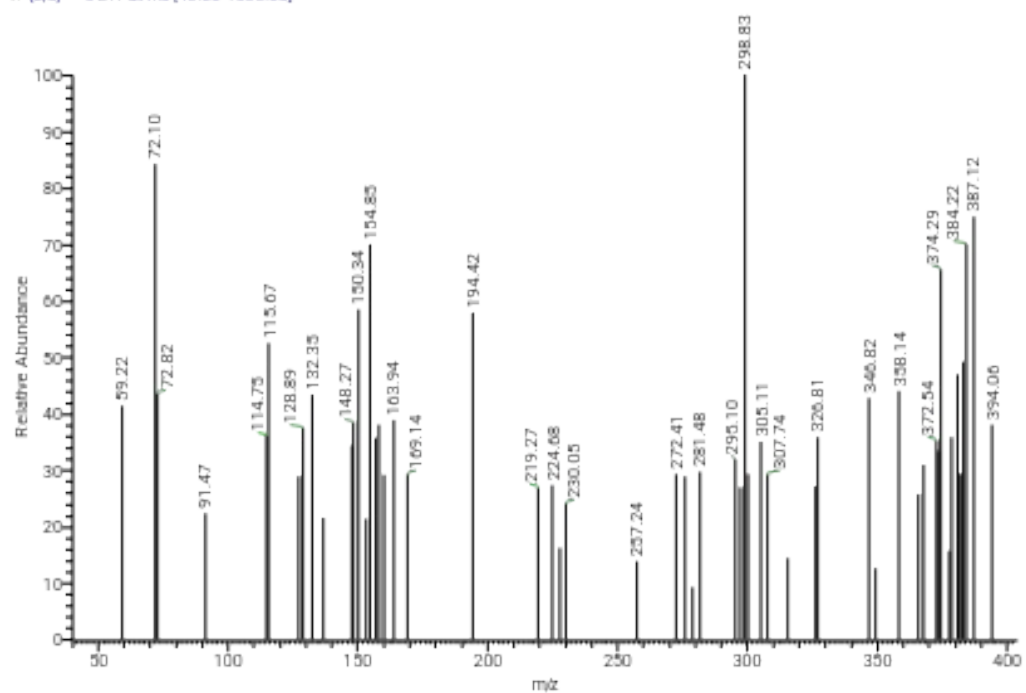




The mass spectrum of compound 8

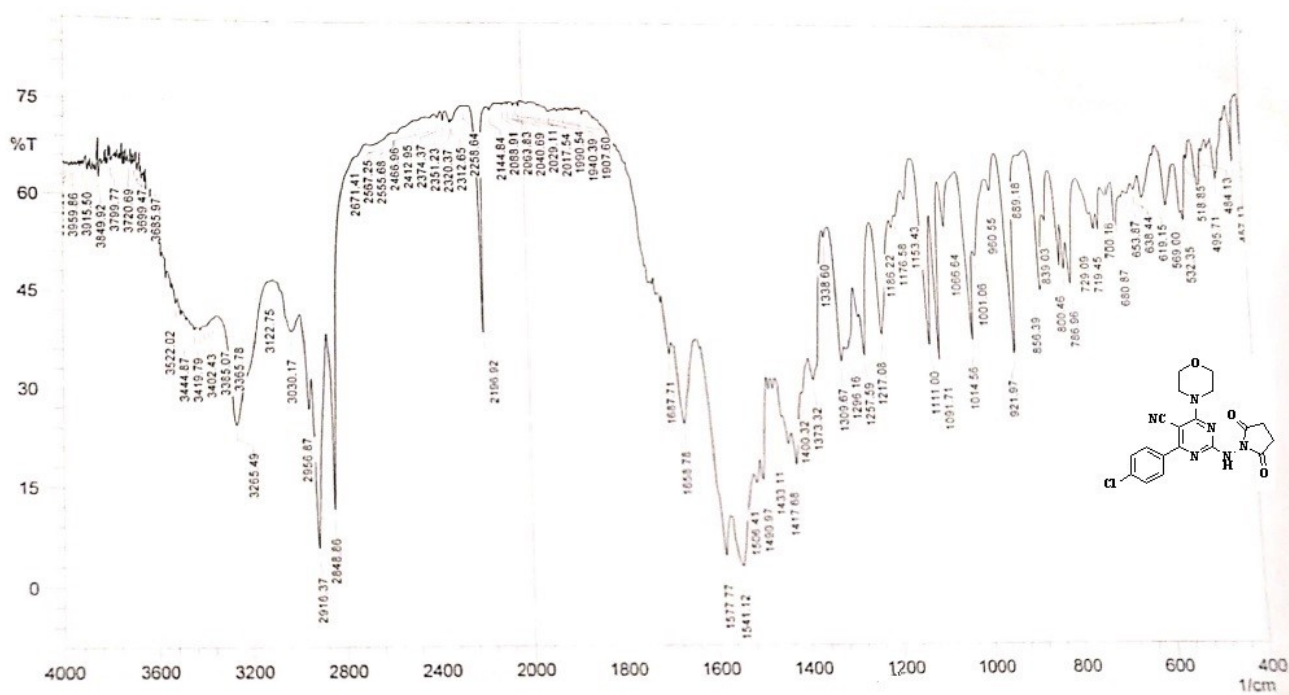


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T: {0,0} +cEI Full ms [40.00-1000.00]

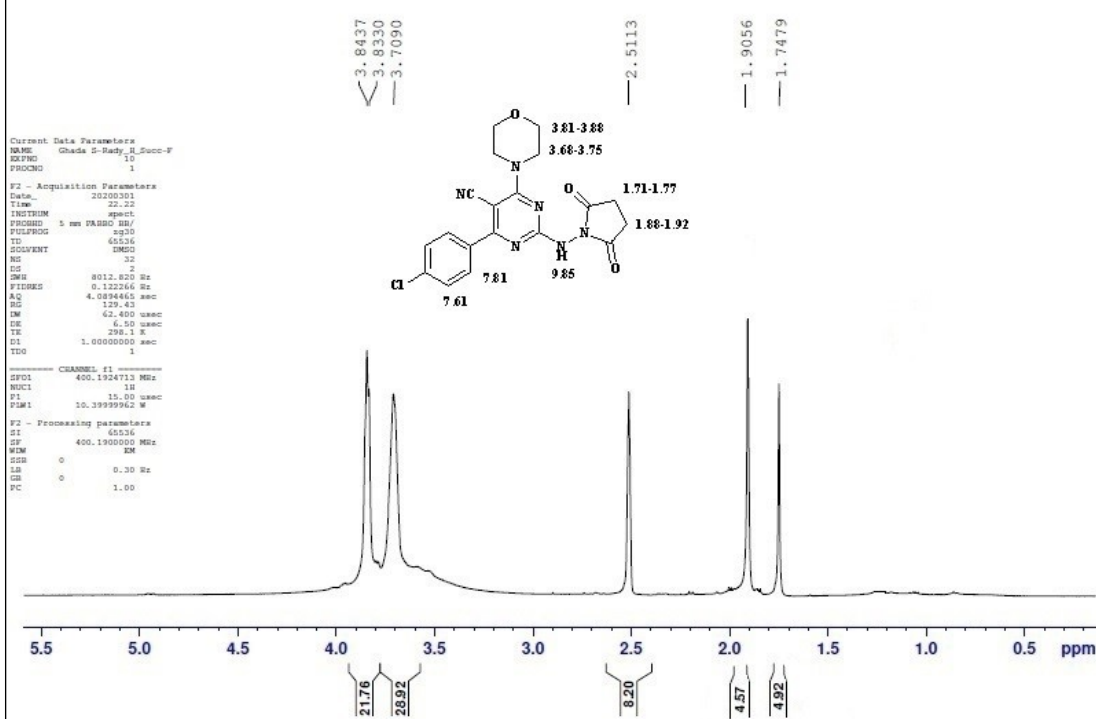
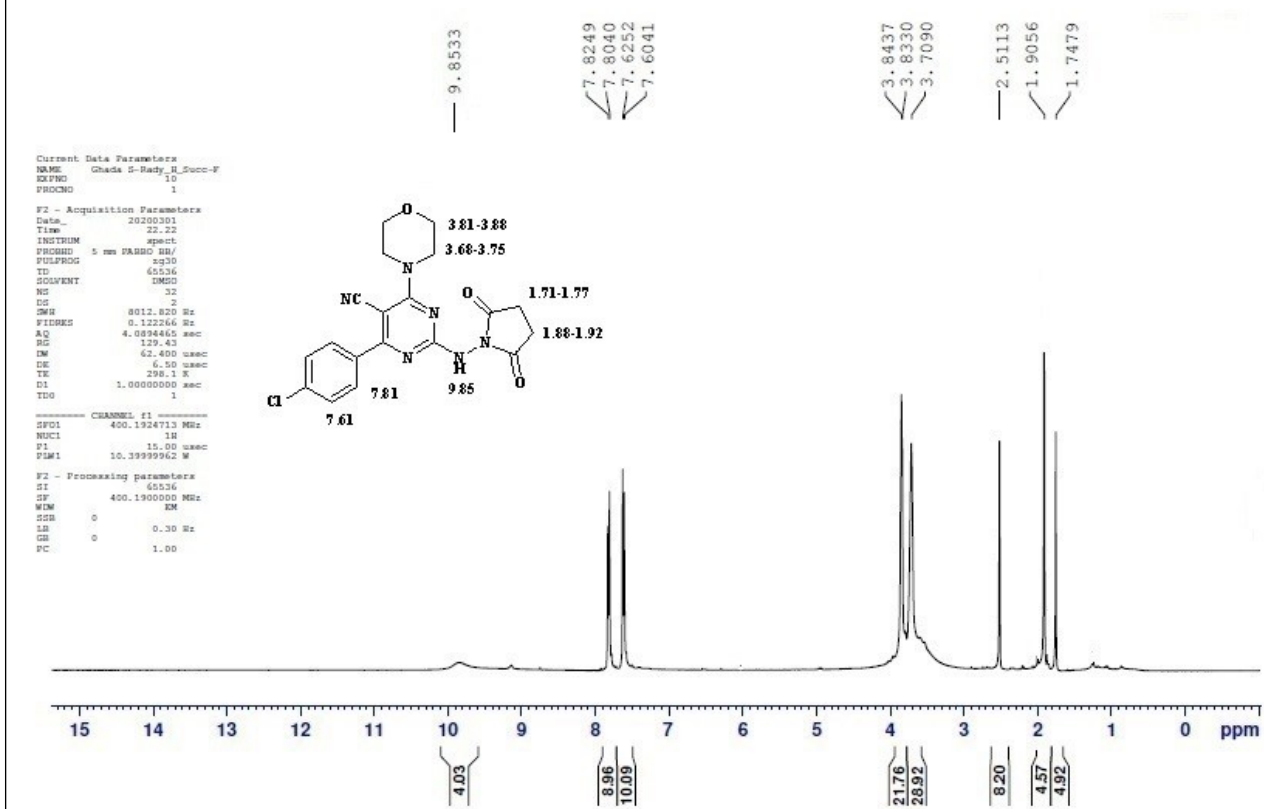


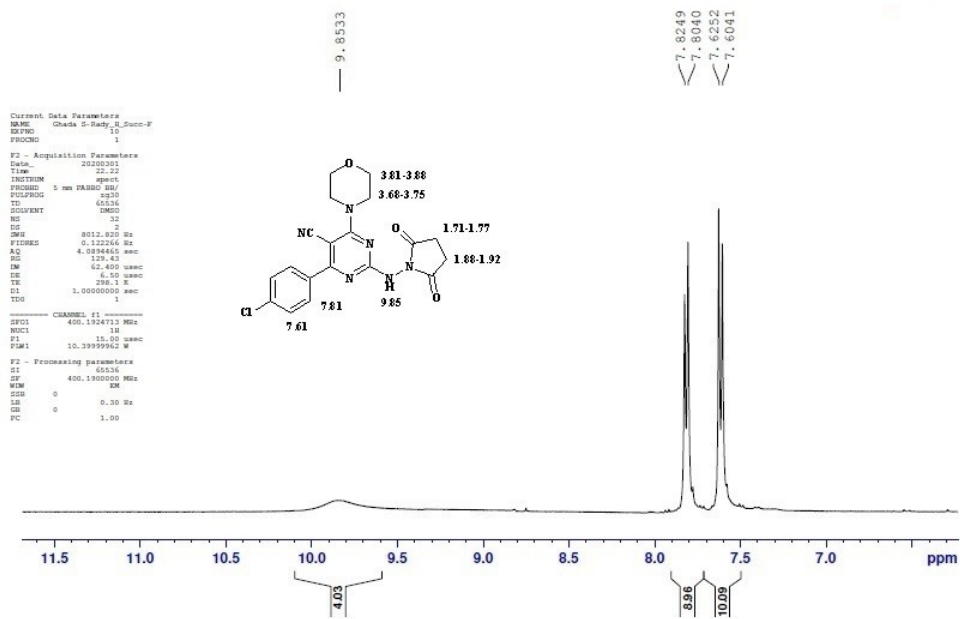
Spectral data of compound 9

The IR spectrum of compound 9

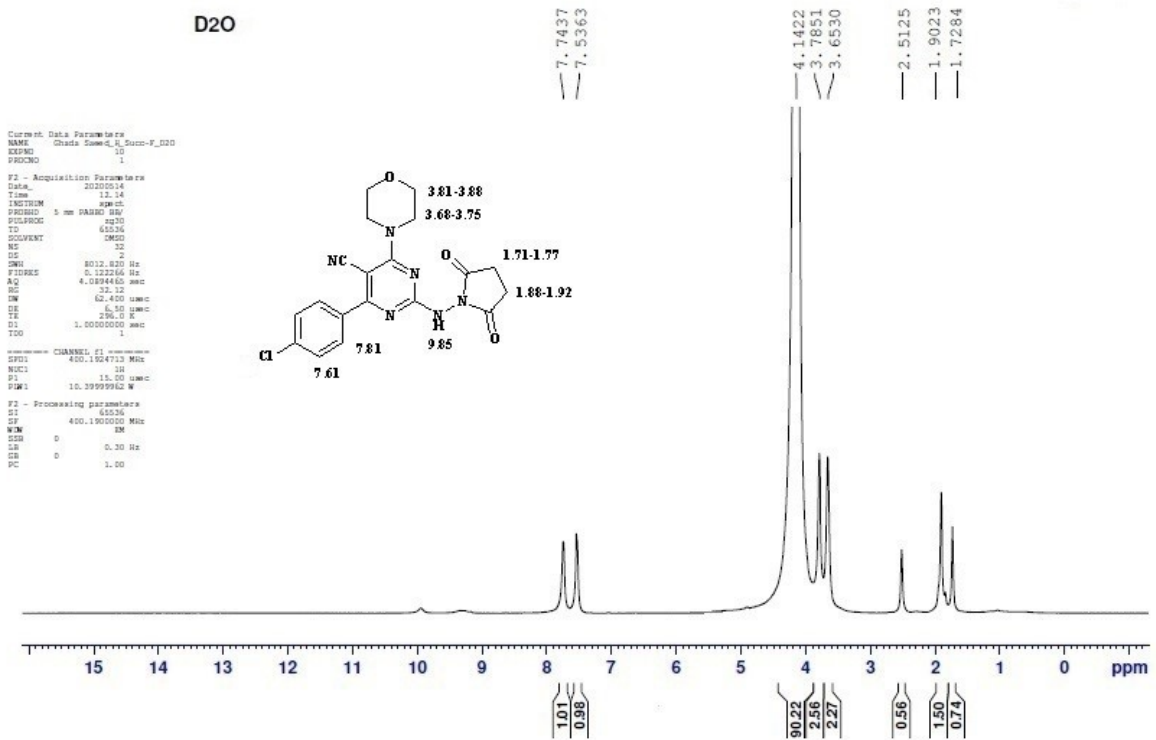


The ¹H NMR spectrum of compound 9

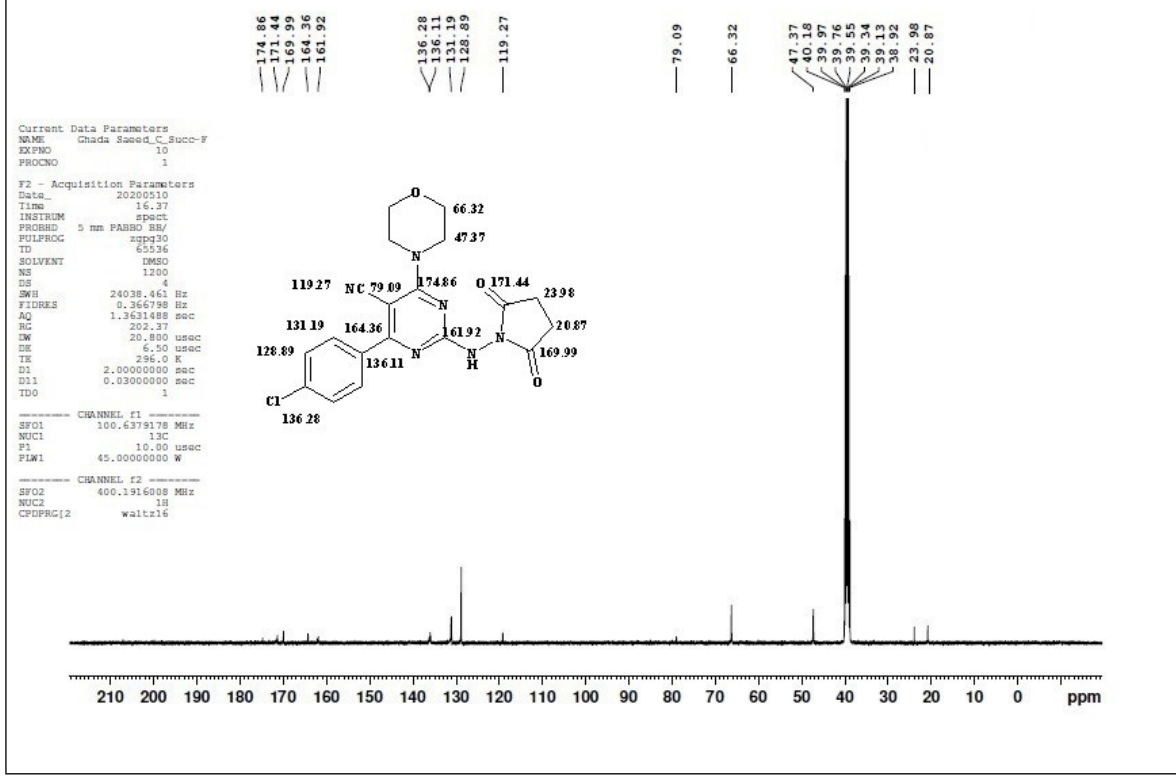




D2O

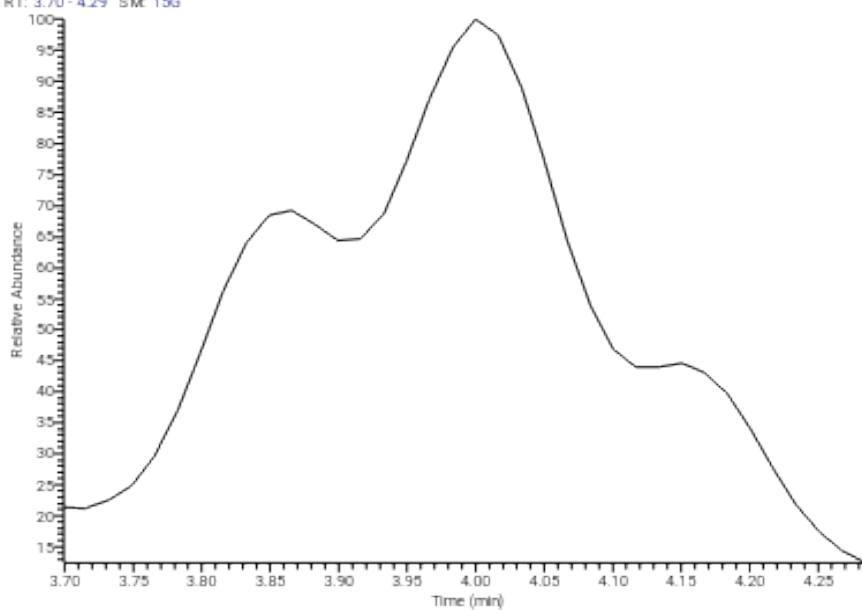


The ¹³C NMR spectrum of compound 9



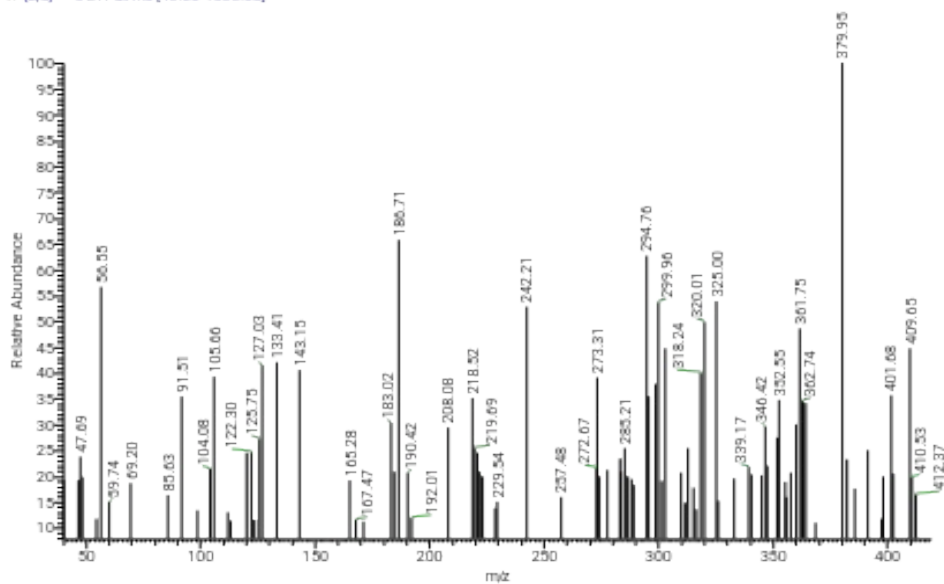
The mass spectrum of compound 9

RT: 3.70 - 4.29 SM: 156



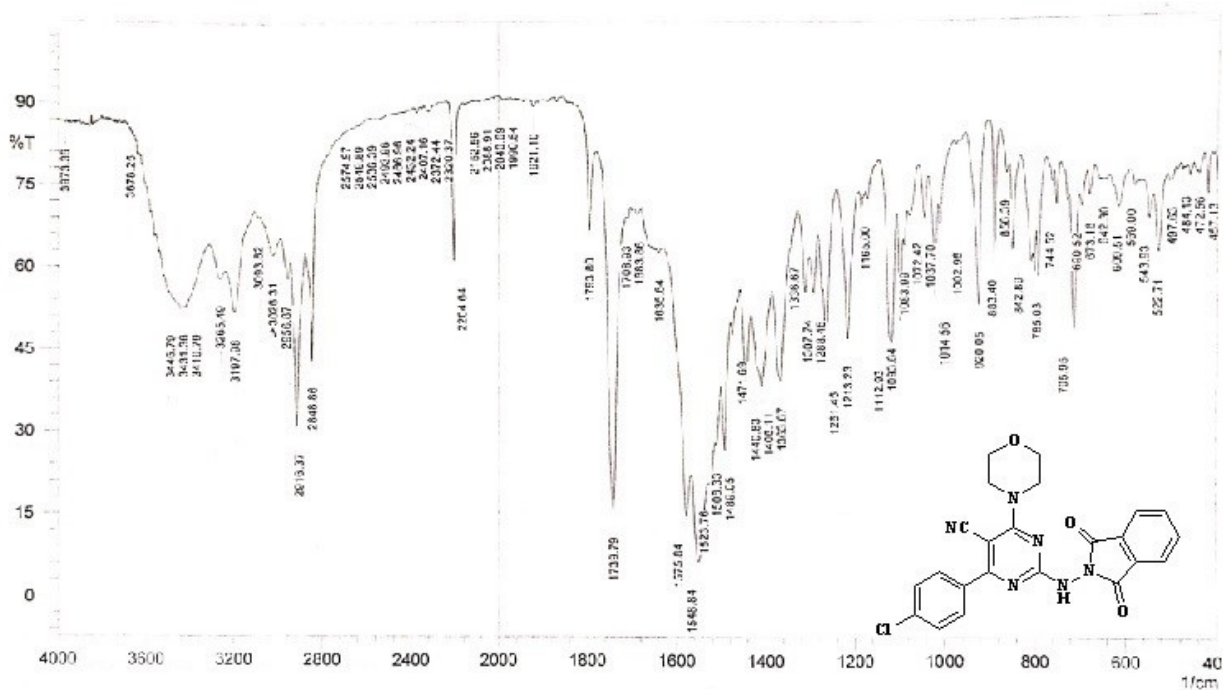
NL:
1.79E4
TIC MS
moshera-
adel-11_2

moshera-adel-11_2 #237 RT: 3.98 AV: 1 SB: 2 4.45, 4.45 NL: 4.79E2
T: {0,0} + cEI Full ms [40.00-1000.00]

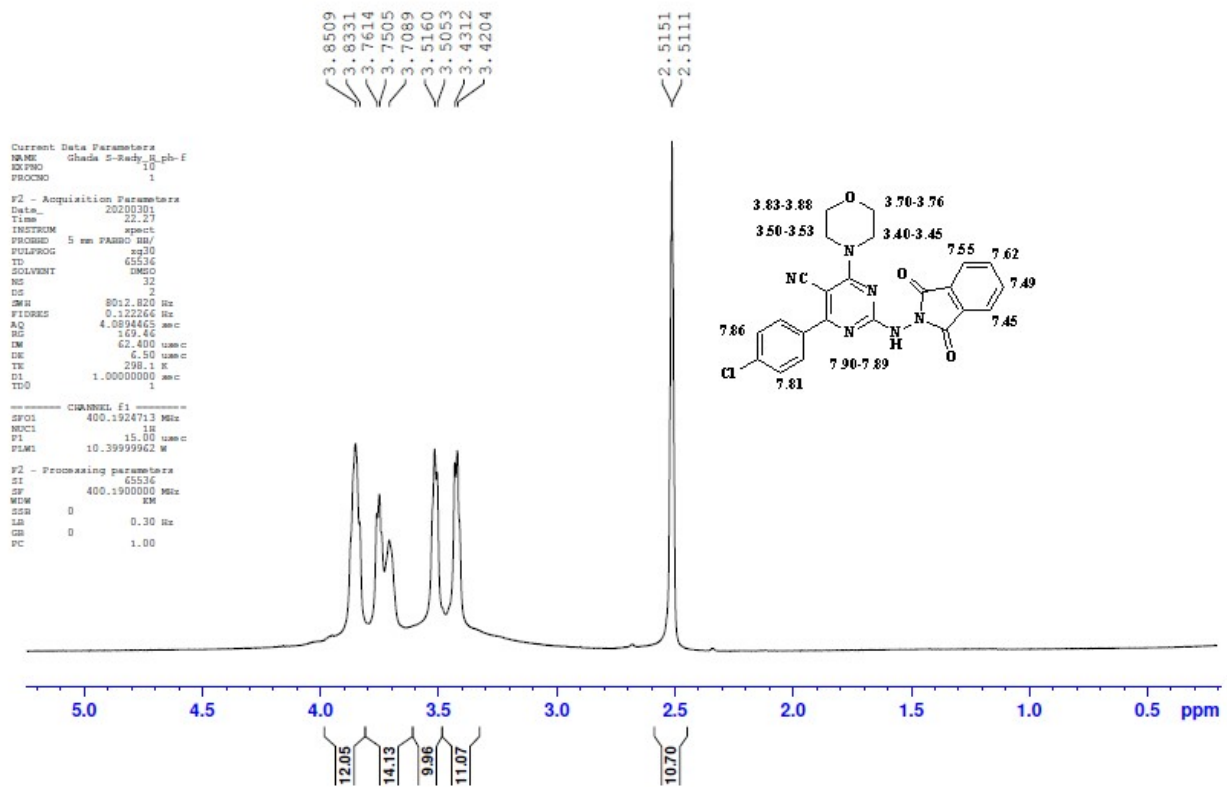
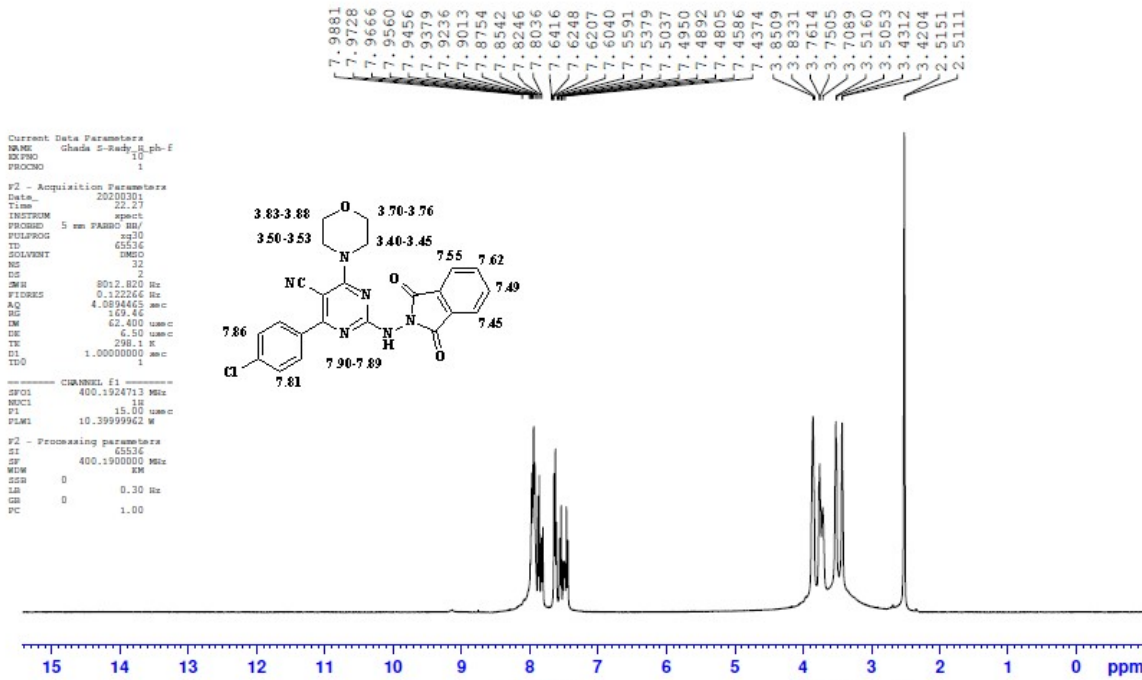


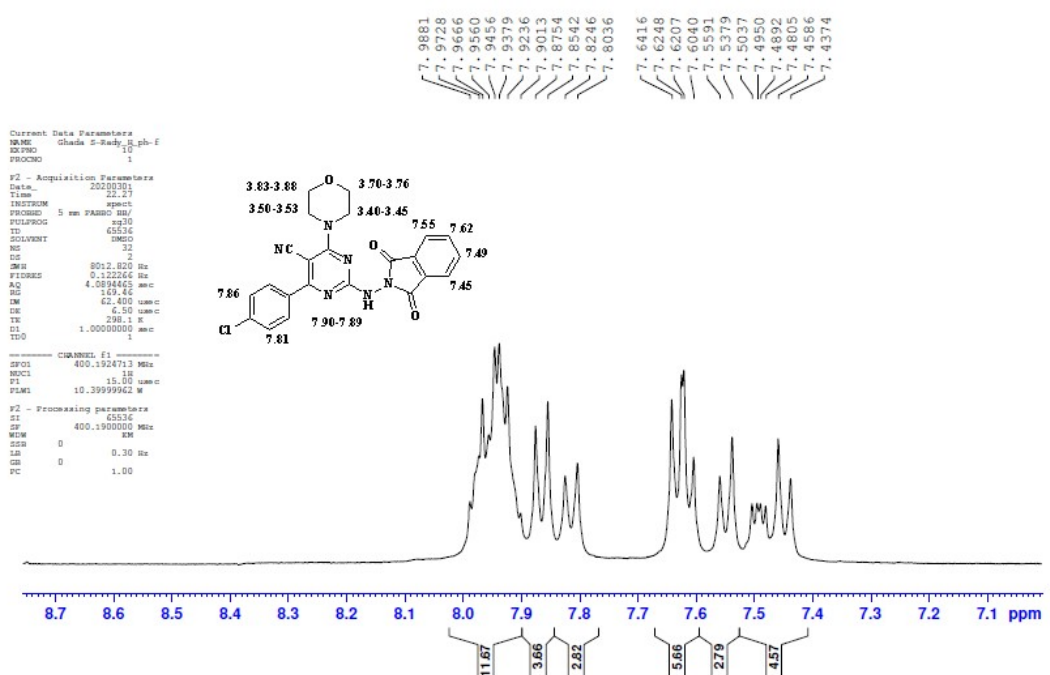
Spectral data of compound 10

The IR spectrum of compound 10

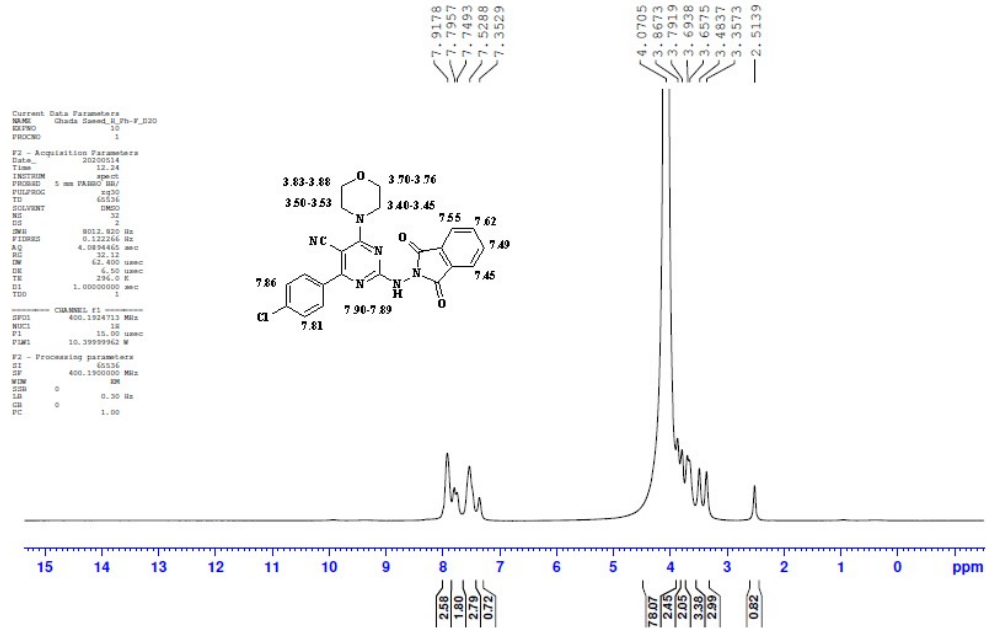


The ¹H NMR spectrum of compound 10





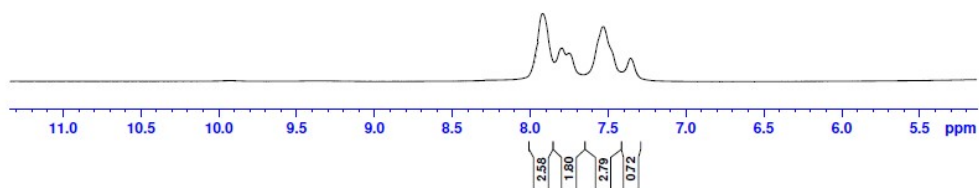
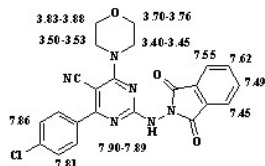
D2O

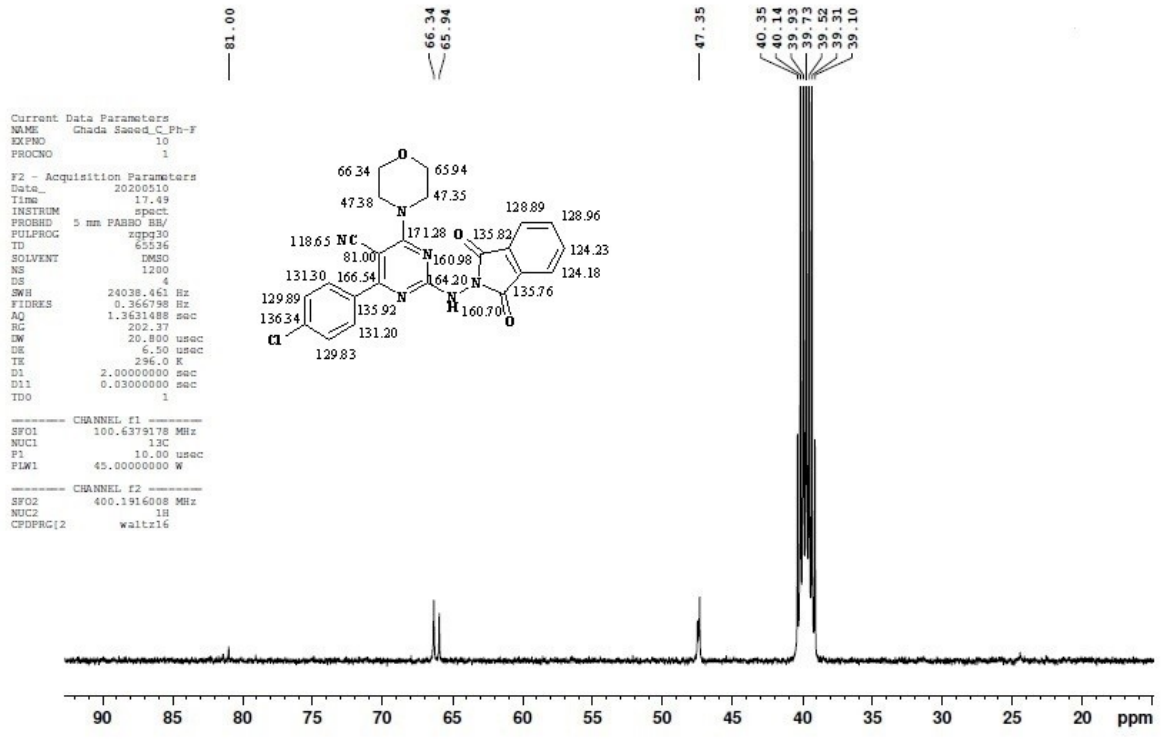


D2O

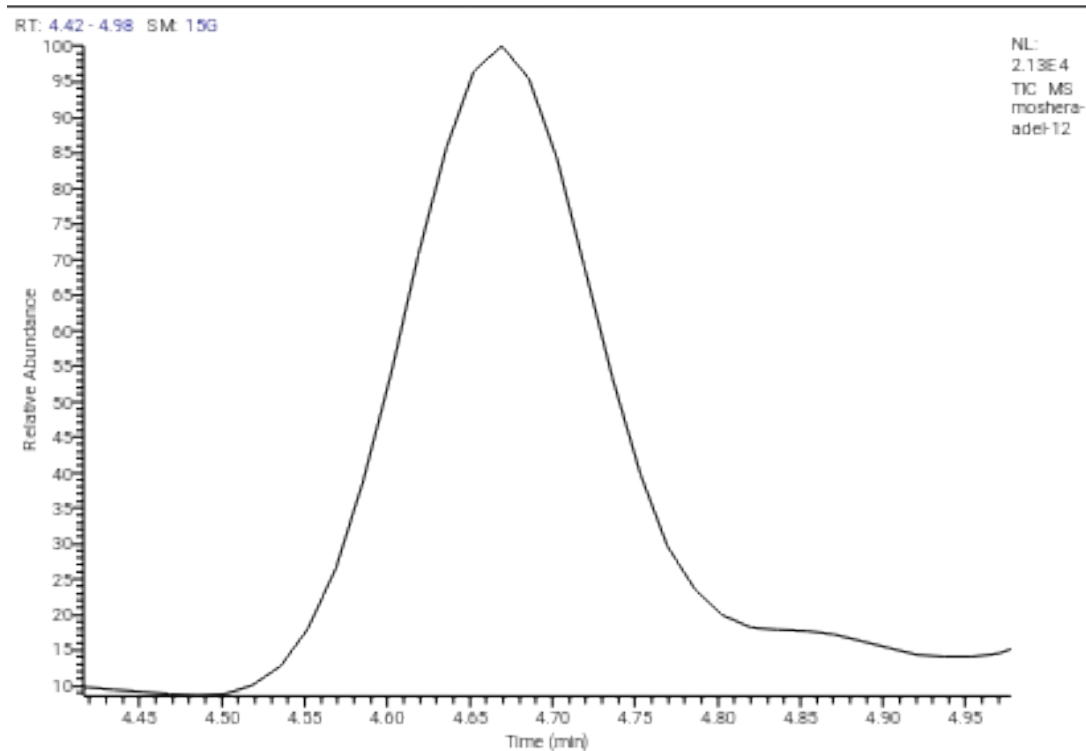
7.9178
7.7957
7.7493
7.5288
7.3529

Current Data Parameters
NAME Chda_Seed_10_P_D2O
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20200514
Time 12.14
INSTRUM spect
PROBHD 5 mm VAMC QNP
PULPROG zgpg30
TD 65536
SOLVENT DMSO
SI 32
SF 400.1464000 MHz
WDW EM
SSB 0
FIRING 0.322266 Hz
AQ 4.938465 sec
RG 32.12
CW 62.400 uspc
DE 6.50 uspc
TE 300.2 K
D1 1.00000000 sec
TD 1
----- CHANNEL f1 -----
SFO1 400.1464113 MHz
NUC1 15
P1 15.00 uspc
FREQ 10.3999962 MHz
F2 - Processing parameters
SI 65536
SF 400.1464000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

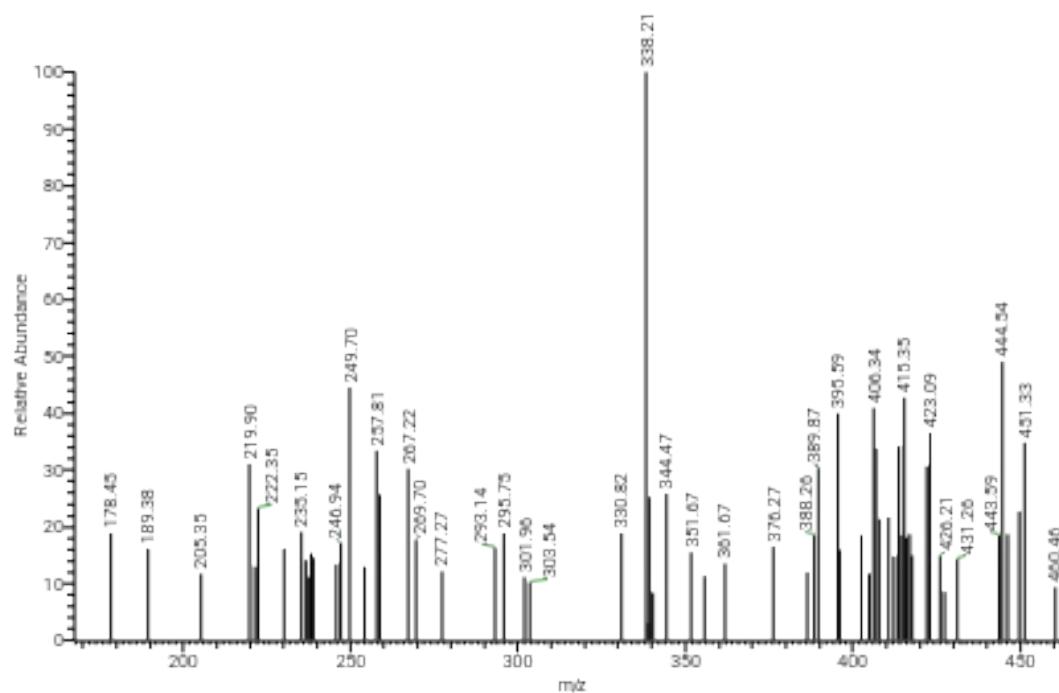




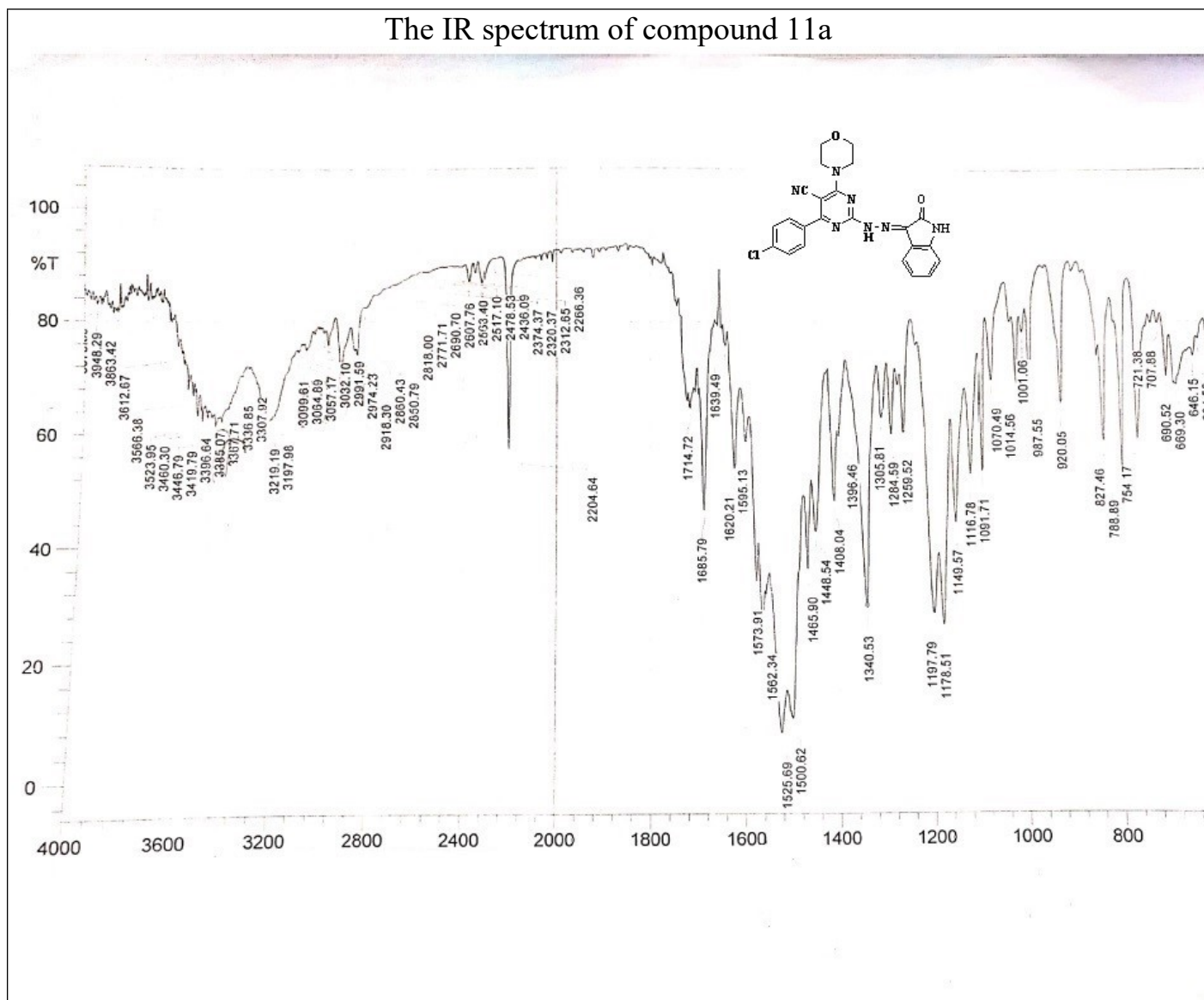
The mass spectrum of compound 10



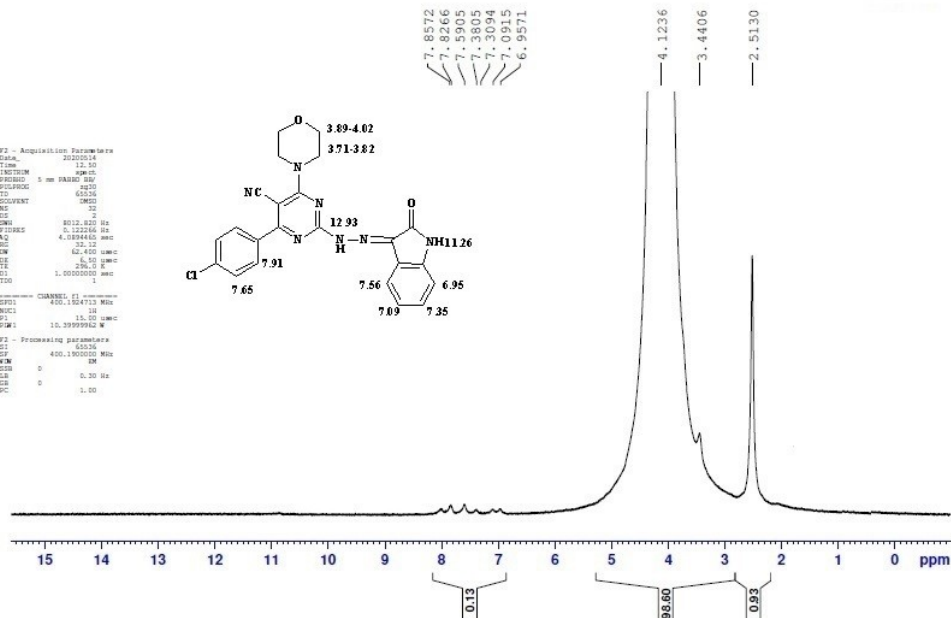
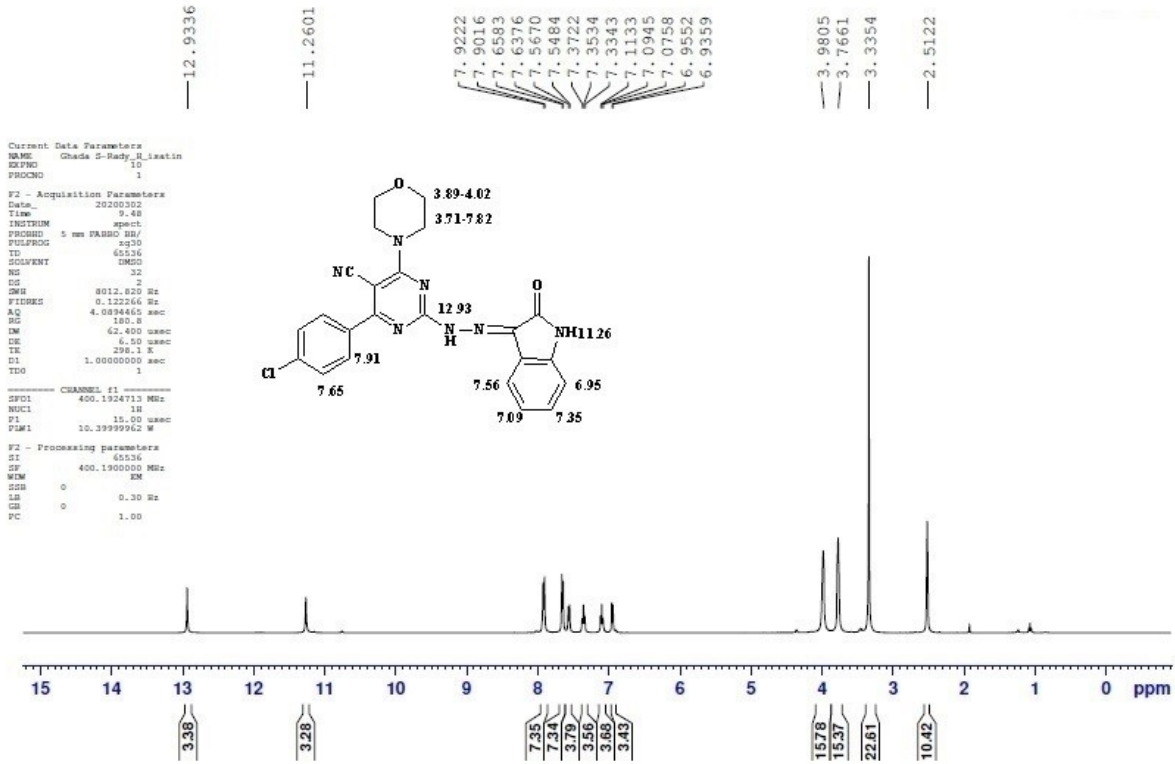
moshera-adel-12 #180 RT: 3.03 AV: 1 SB: 2 4.45, 4.45 NL: 6.04E2
T: {0,0} + c EI Full ms [40.00-1000.00]



Spectral data of compound 11a

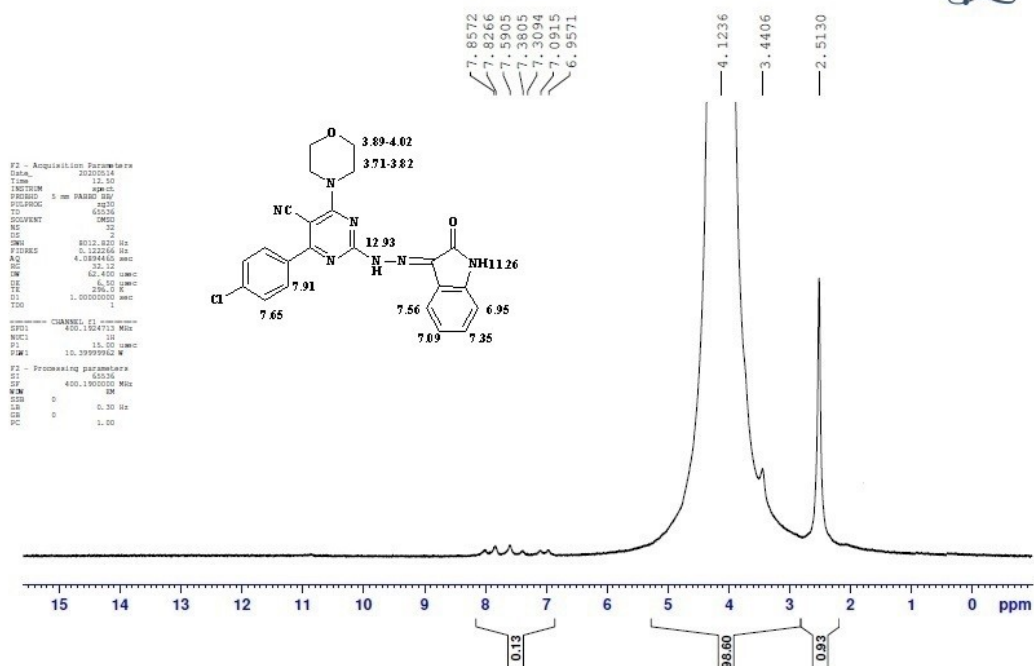


The ¹H NMR spectrum of compound 11a



D2O

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www.pharma.cu.edu.eg dir-mau.fopcu@pharma.cu.edu.eg

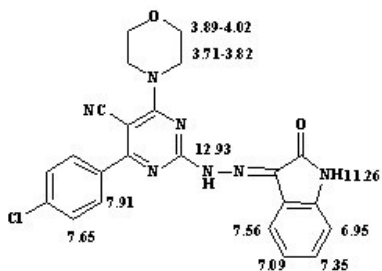


D2O

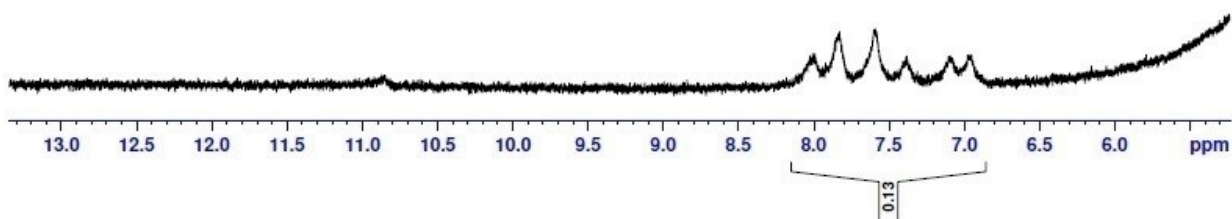
Current Data Parameters
NAME Chada_Saad_H_Isoatin_D2O
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200514
Time 15.50
INSTRUM spect
PROBHD 5 mm PABBO BB
PULPROG zg30
TD 65536
SFO1 400.1500000 MHz
SOLVENT DMSO
NS 32
DS 2
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894465 sec
RG 32.12
DM 62.400 usec
DE 6.50 usec
TE 296.2 K
D1 1.0000000 sec
TD 1

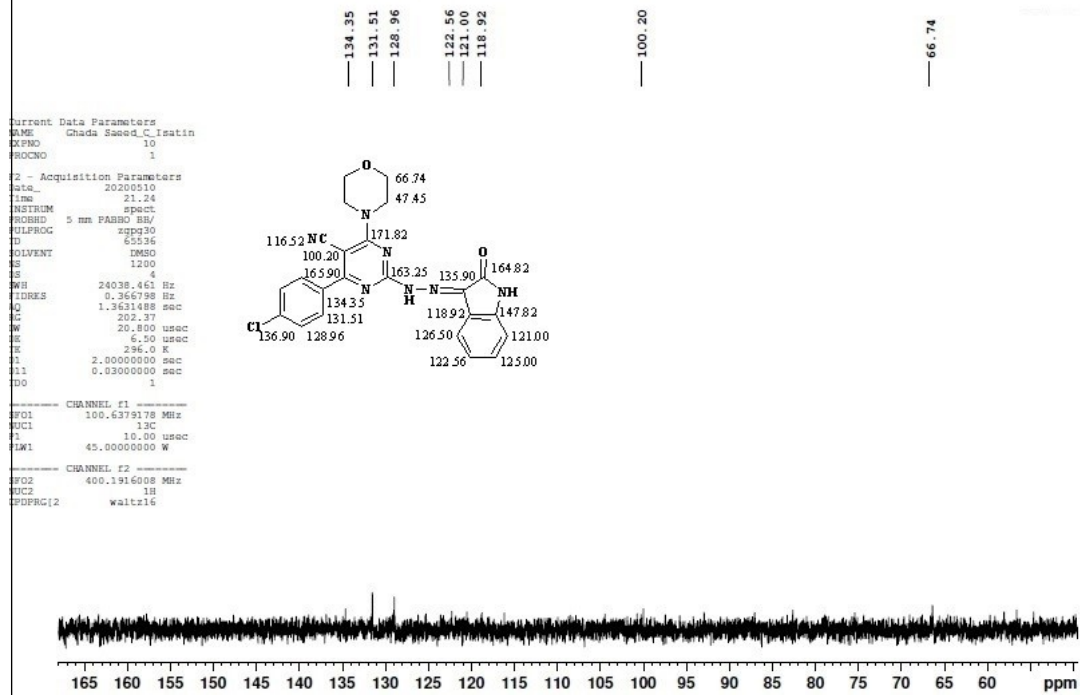
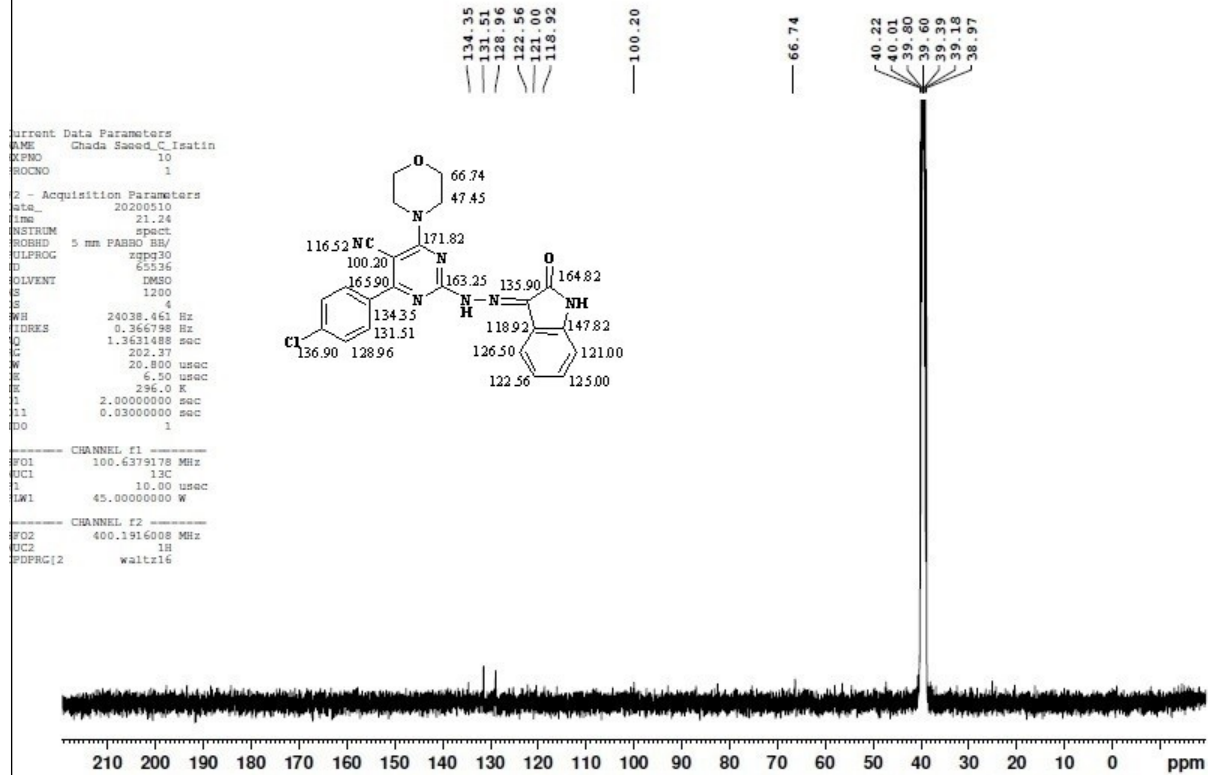
==== CHANNEL 1 =====
SFO1 400.1524713 MHz
NUC1 1H
P1 15.00 usec
P1M1 10.29999962 W
F2 - Processing parameters
SI 65536
SF 400.1500000 MHz
WDW EM
SSB 0 0.30 Hz
GB 0
PC 1.00



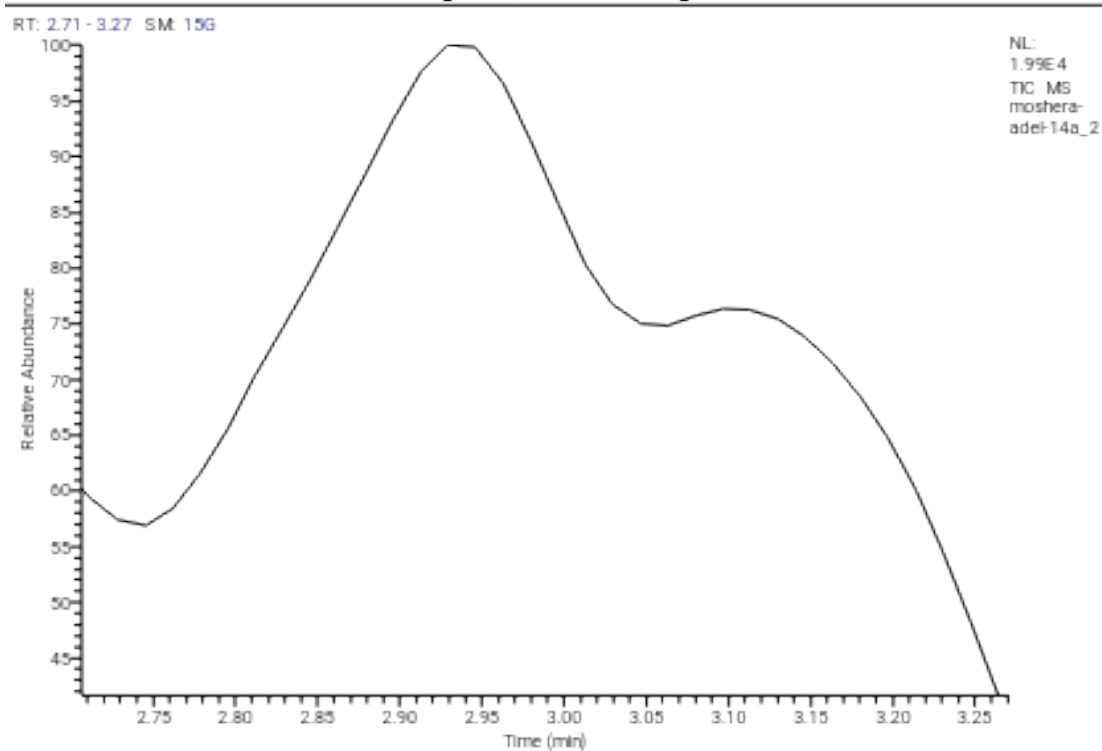
7.8572
7.8266
7.5905
7.3805
7.3094
7.0915
6.9571



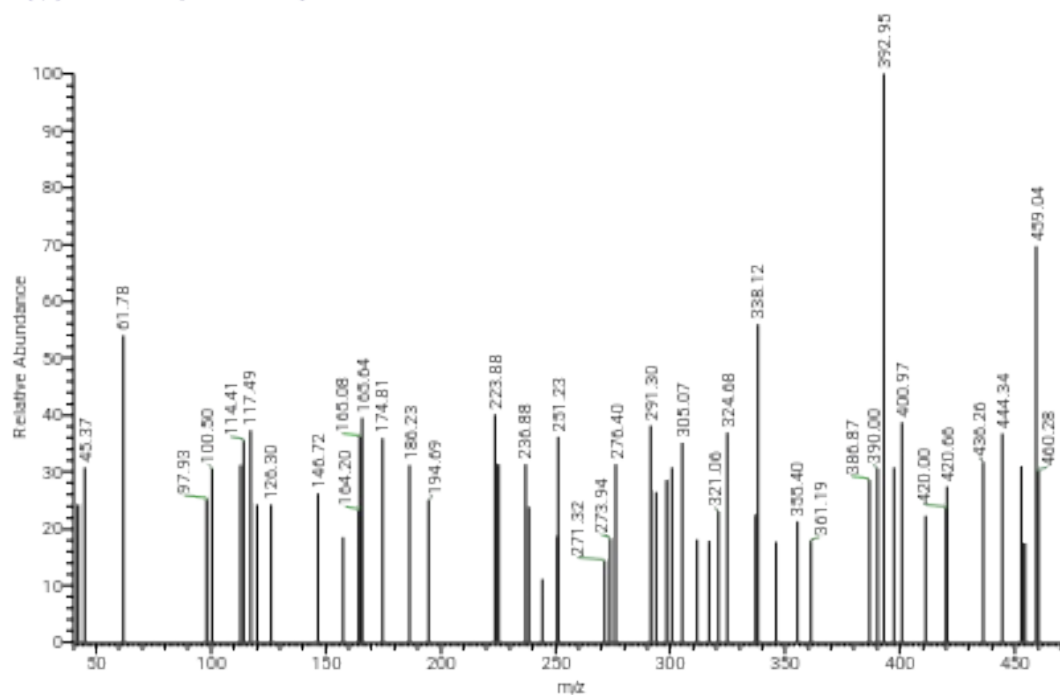
The ¹³C NMR spectrum of compound 11a



The mass spectrum of compound 11a

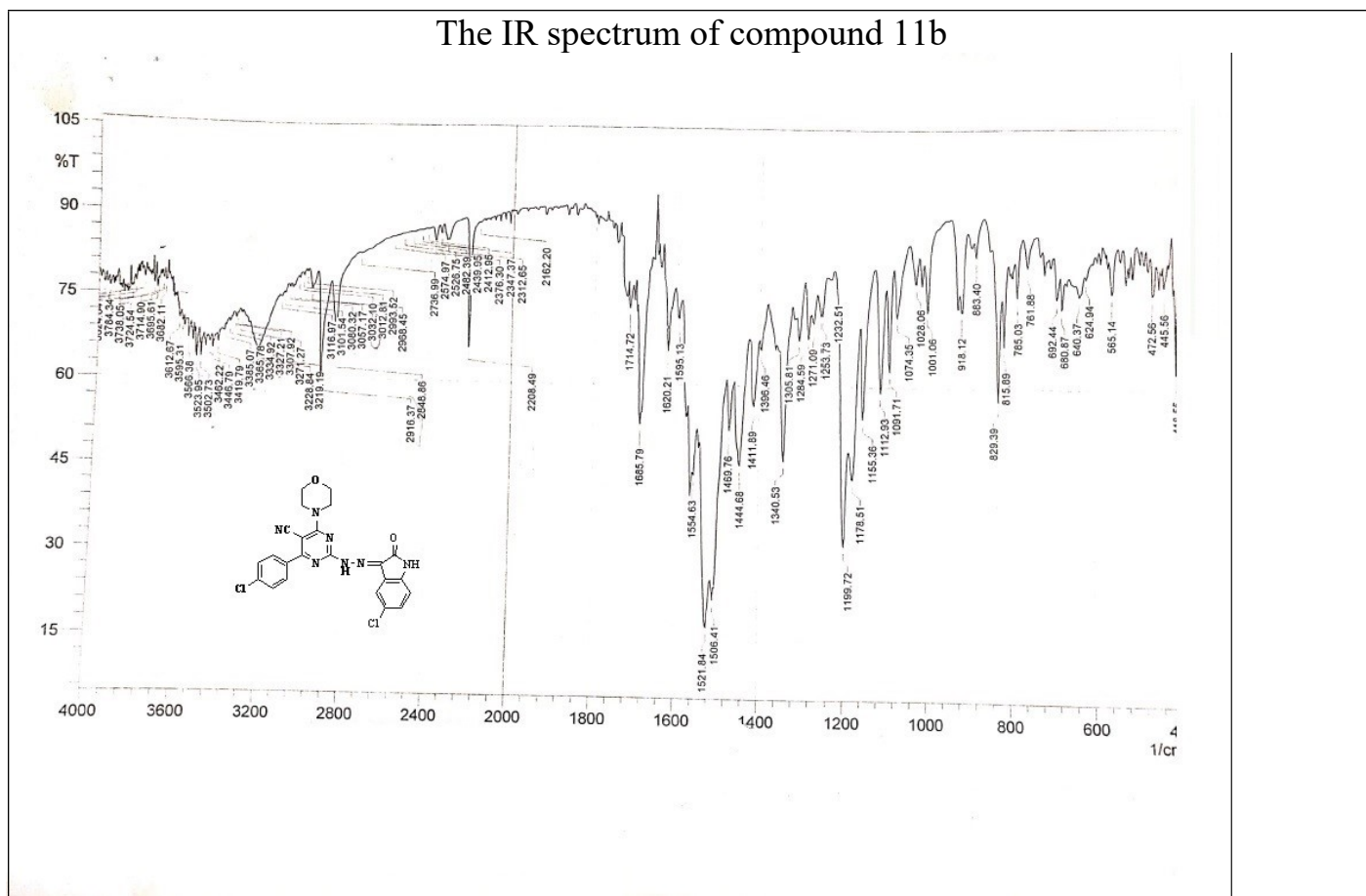


moshera-adel-14a_2 #173 RT: 2.91 AV: 1 SB: 2 4.44, 4.44 NL: 3.01E2
T: {0,0} + c EI Full ms [40.00-1000.00]

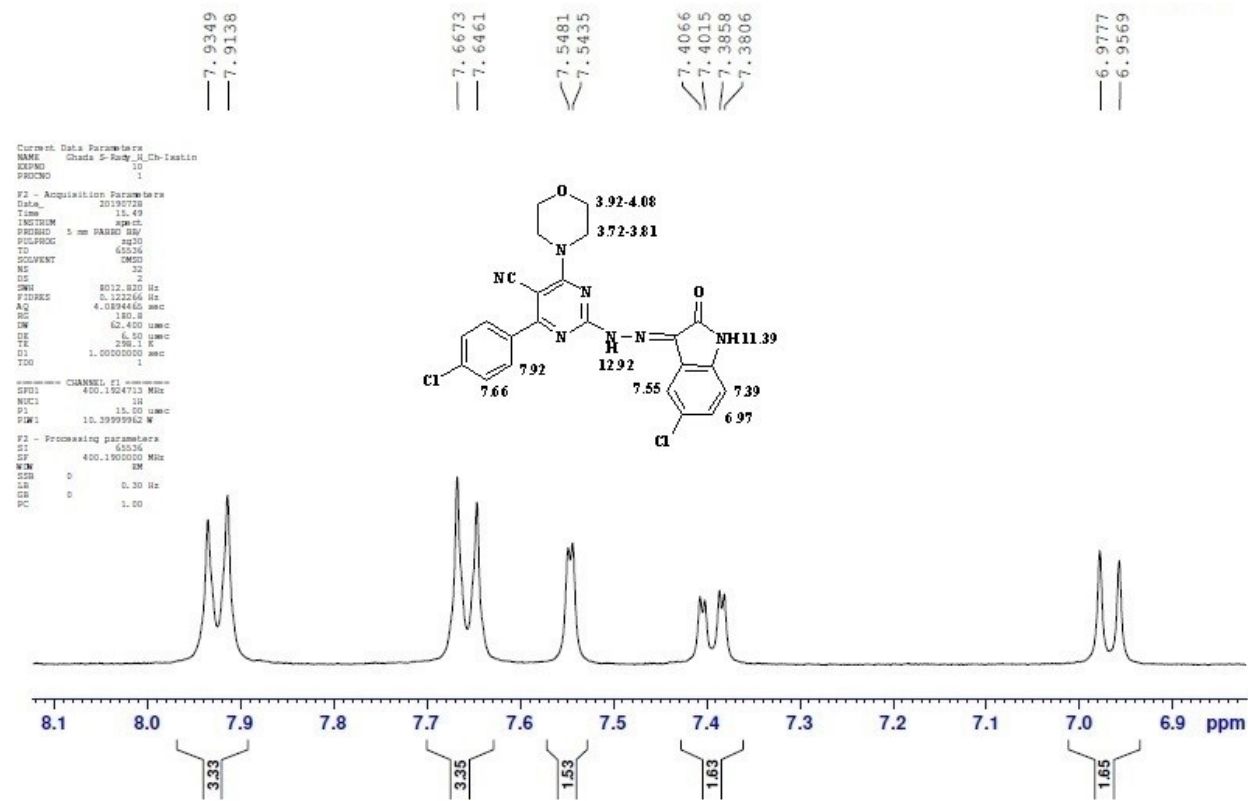
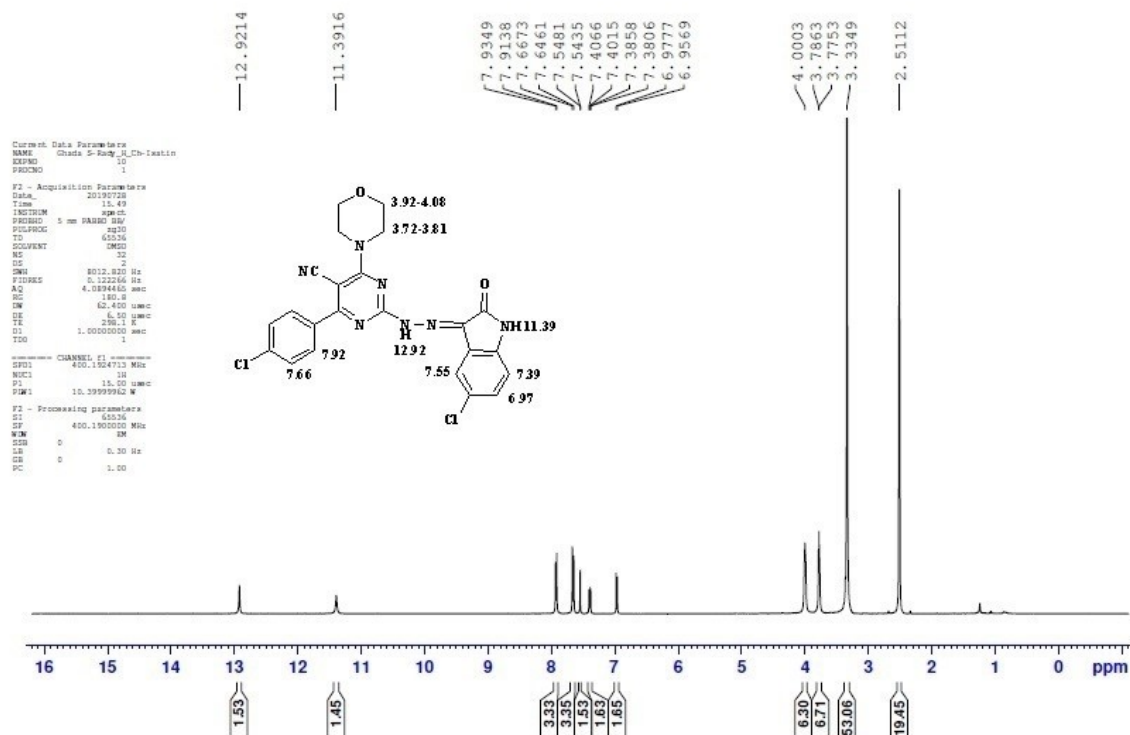


Spectral data of compound 11b

The IR spectrum of compound 11b



The ¹H NMR spectrum of compound 11b



Current Data Parameters
 NAME Chada 5-Roxy_H_Cb-Iustin
 EXPNO 10
 PROCNO 1

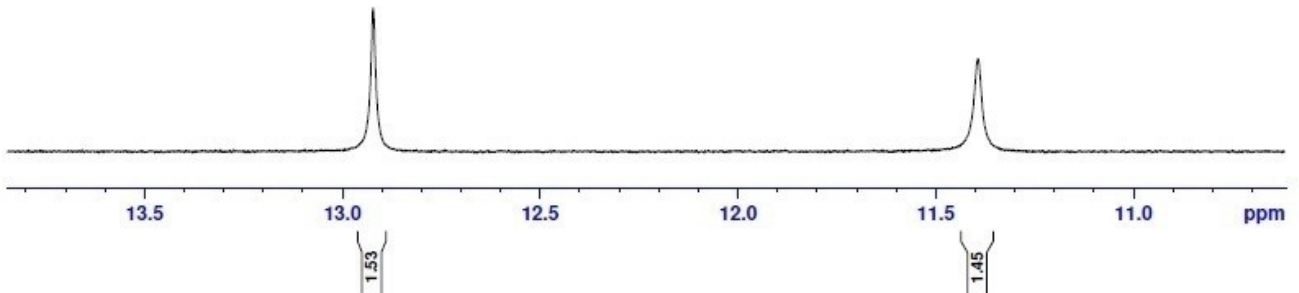
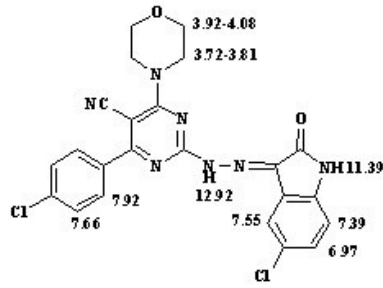
F2 - Acquisition Parameters
 Date_ 20190728
 Time 15.49
 INSTRUM spect
 PULPROG zgpg30
 TO 65236
 SOLVENT DMSO
 NS 32
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.122266 Hz
 AQ 4.089465 sec
 RG 180.8
 SW 52.400 umc
 DE 6.50 umc
 TE 300.2 K
 D1 1.0000000 sec
 TDG 1

===== CHANNEL f1 =====
 SF01 400.1804713 MHz
 NUCL1 1H
 P1 15.00 umc
 PLW1 10.59999962 W

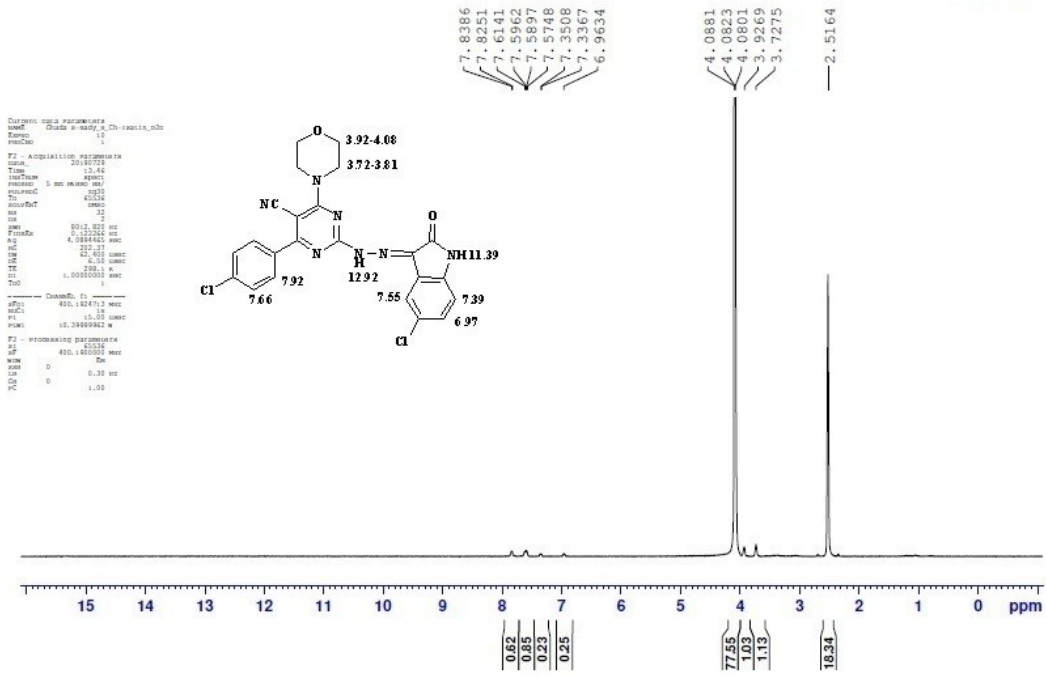
F2 - Processing parameters
 SI 65236
 SF 400.1800000 MHz
 WM 2M
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

— 12.9214

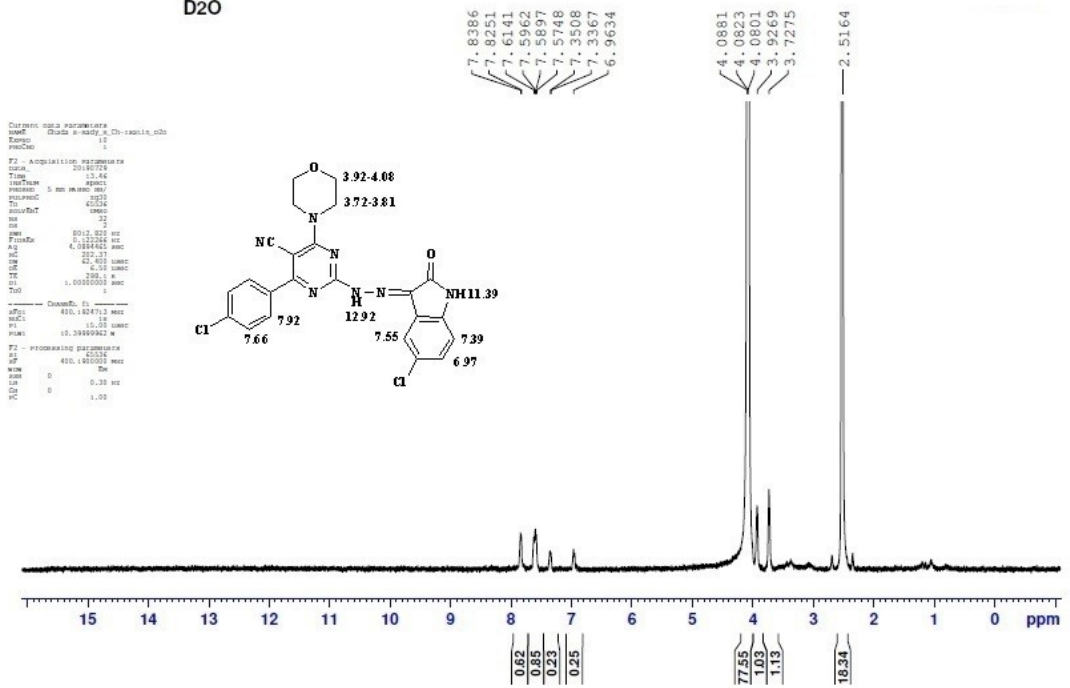
— 11.3916



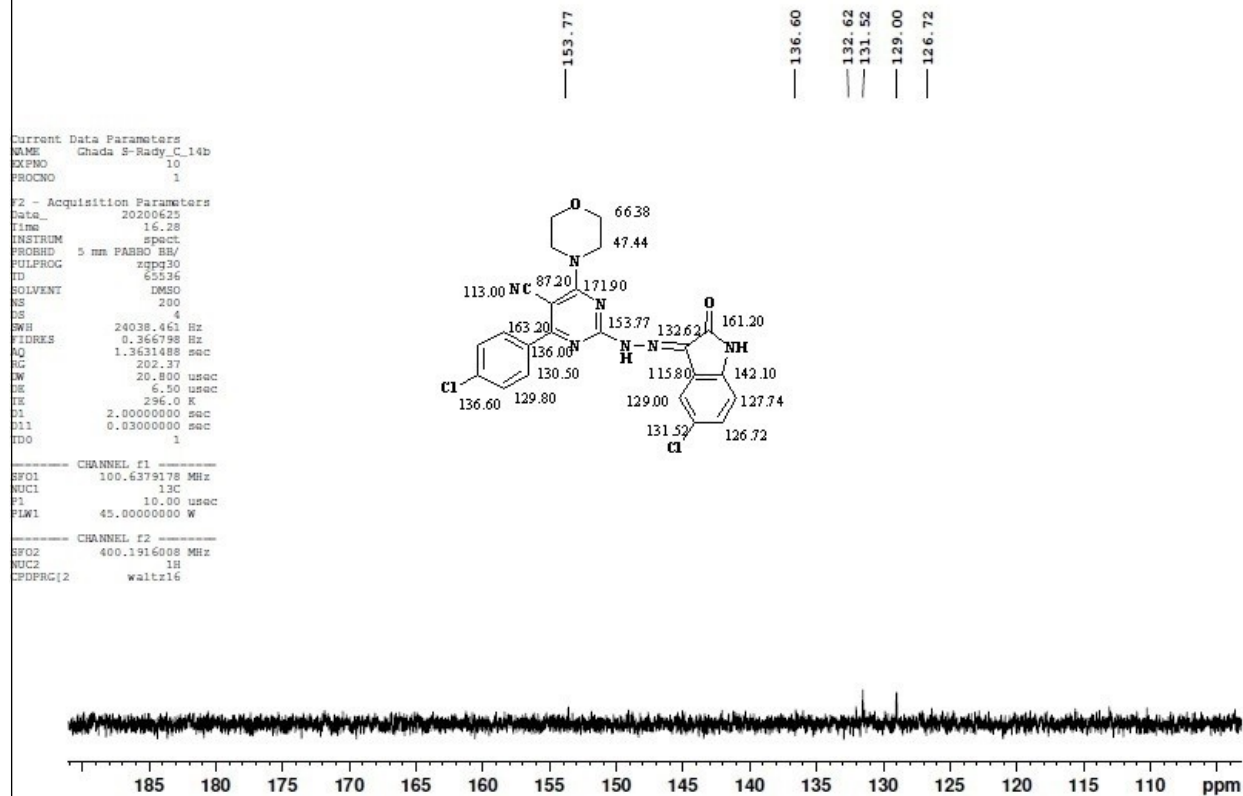
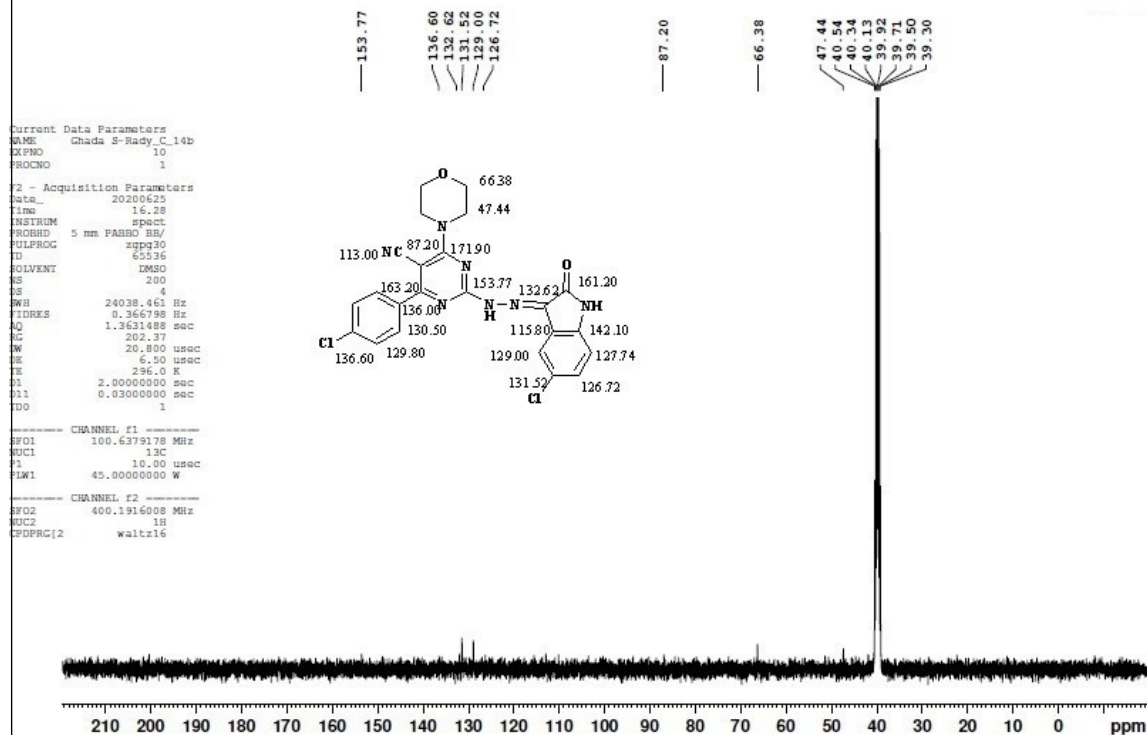
D2O



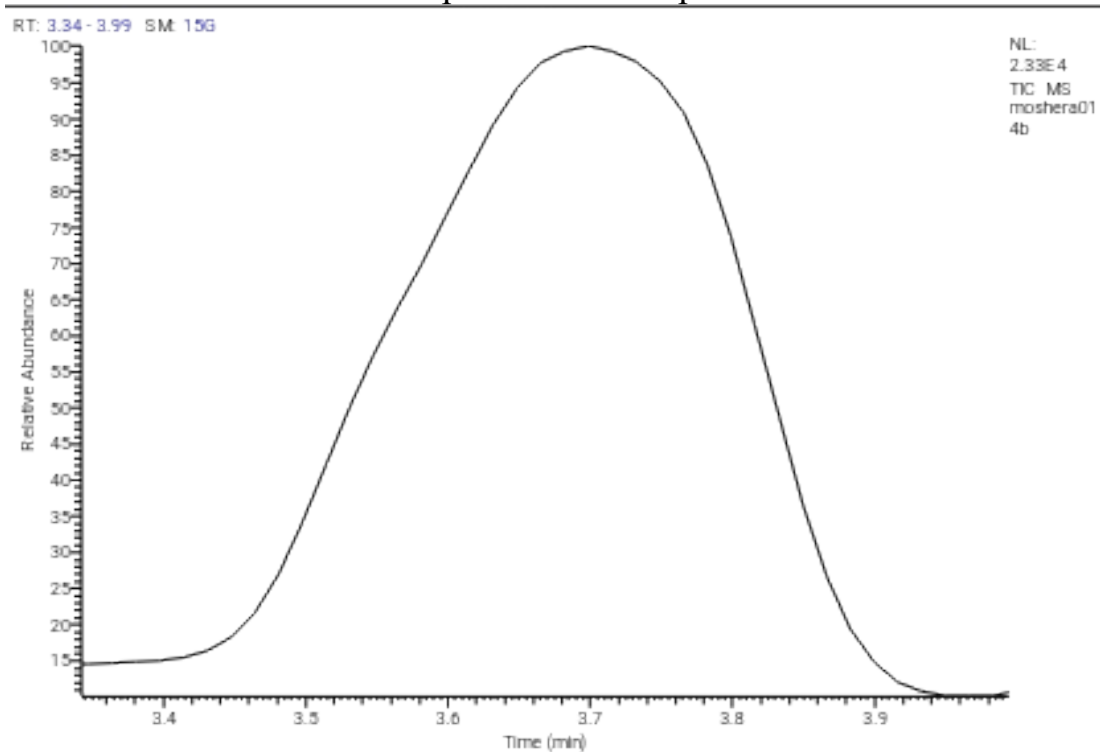
D2O



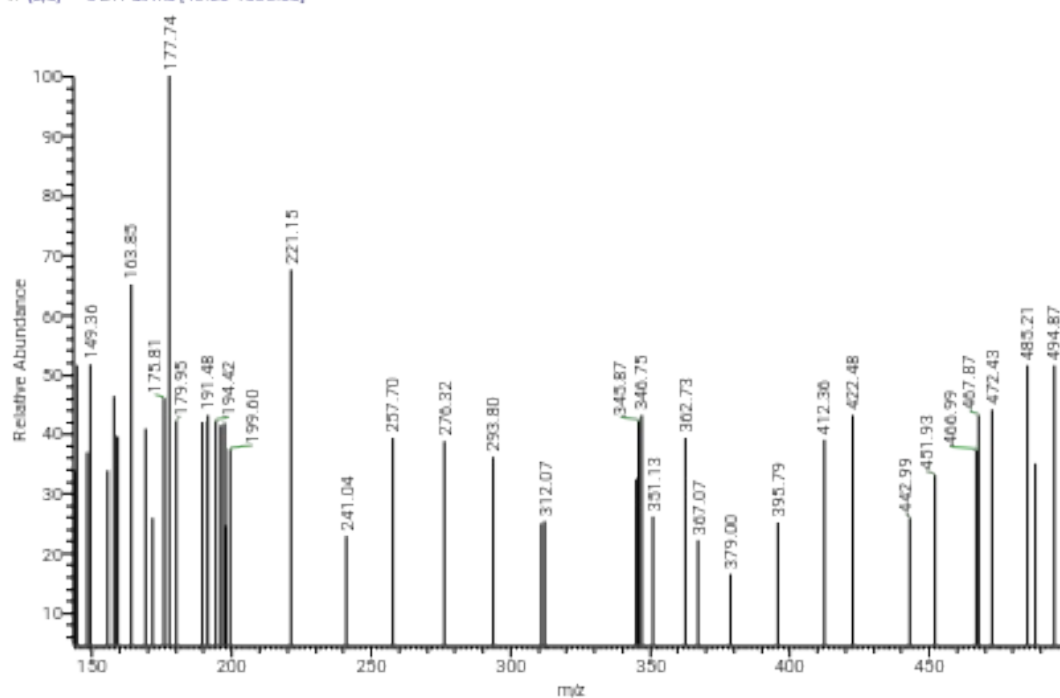
The ¹³C NMR spectrum of compound 11b



The mass spectrum of compound 11b

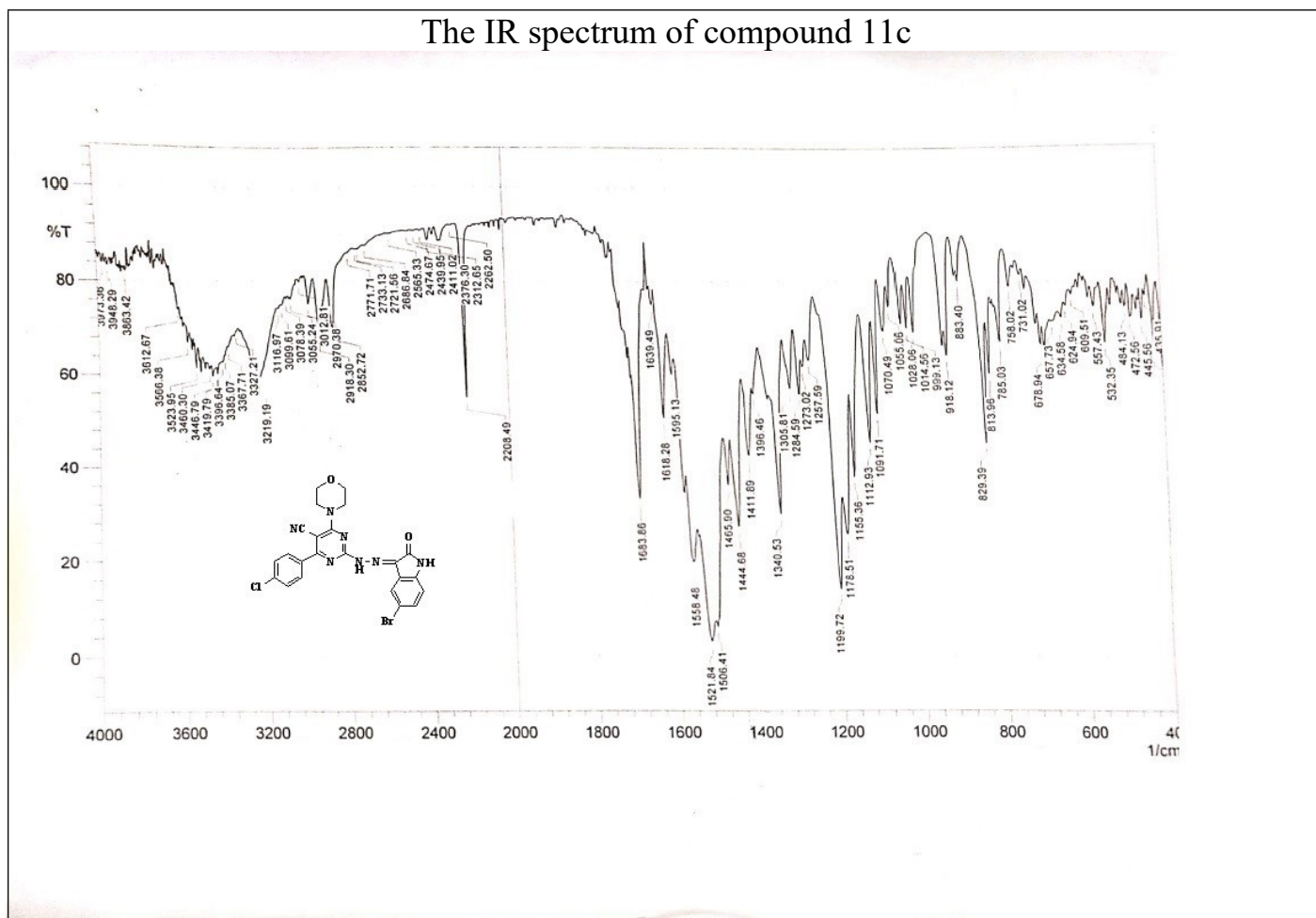


moshera014b #293 RT: 4.92 AV: 1 SB: 2 4.45, 4.45 NL: 2.67E2
T: {0,0} + c EI Full ms [40.00-1000.00]

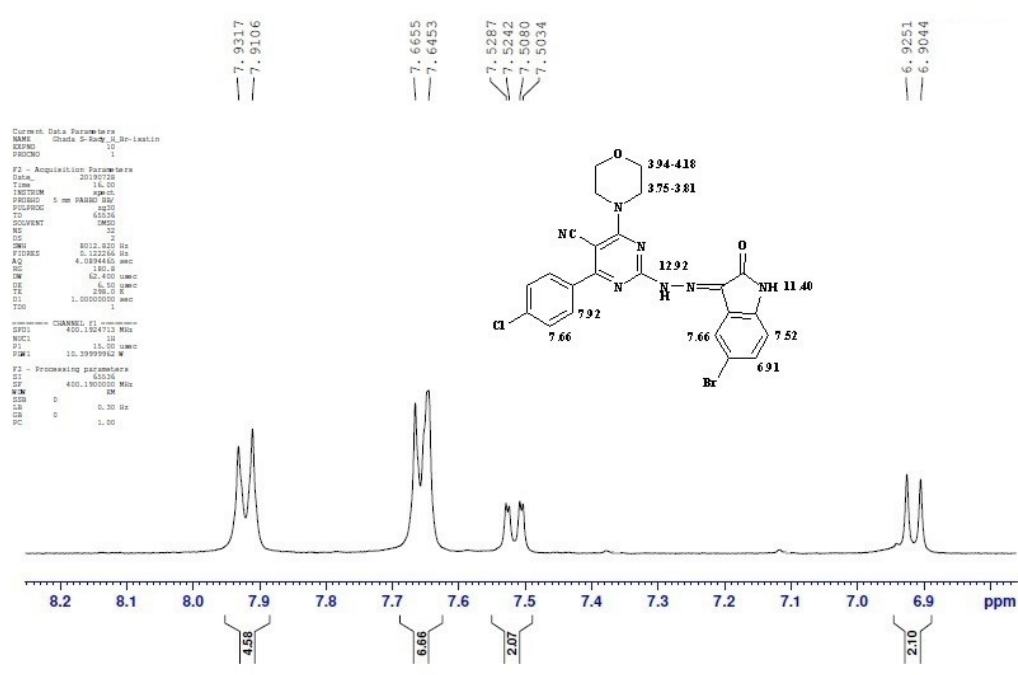
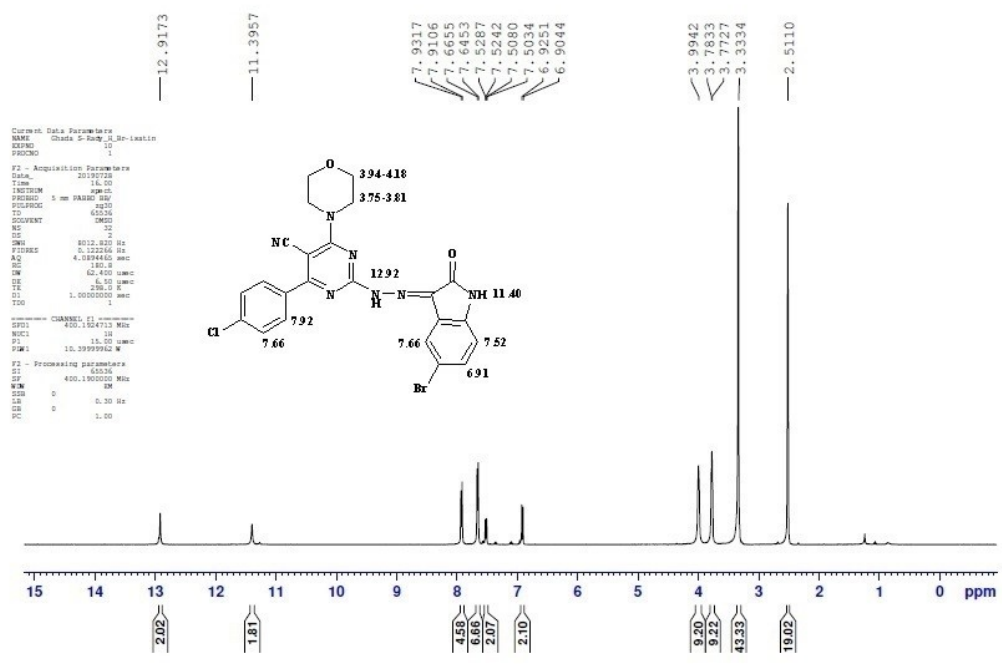


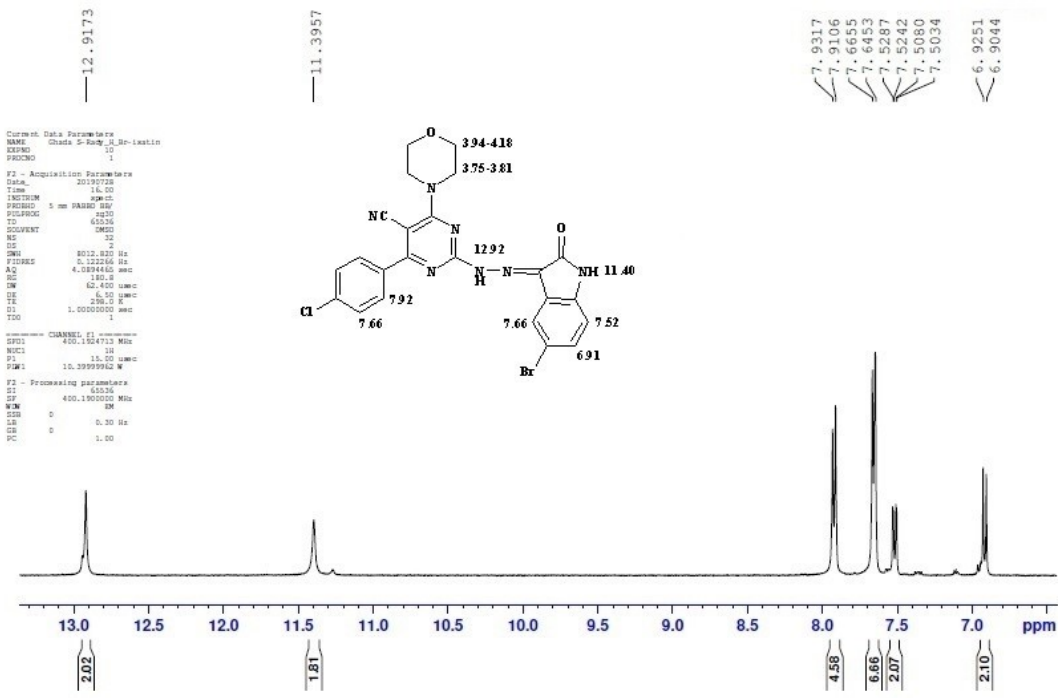
Spectral data of compound 11c

The IR spectrum of compound 11c

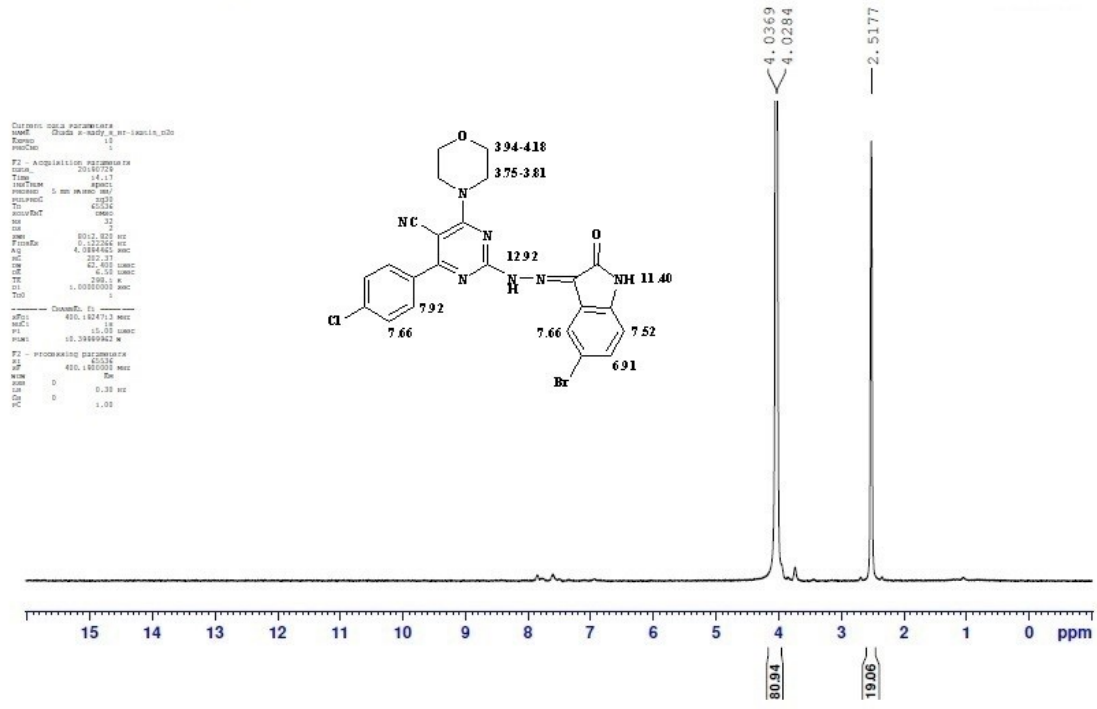


The ¹H NMR spectrum of compound 11c

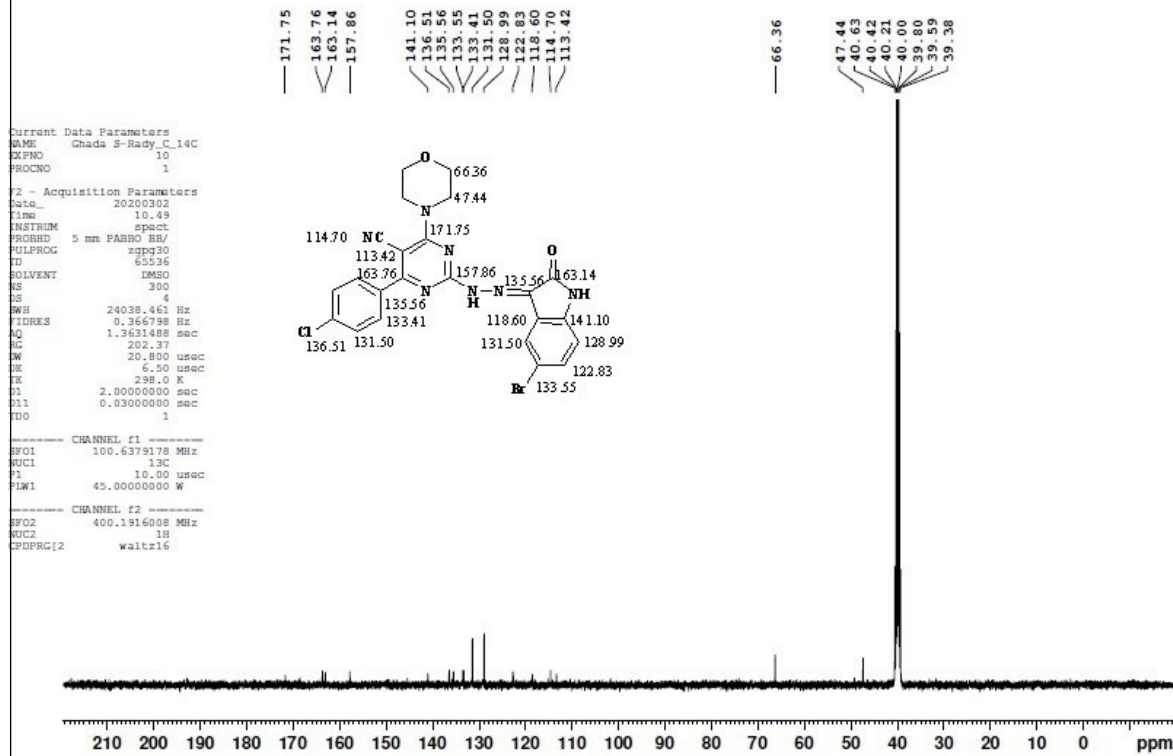




D2O

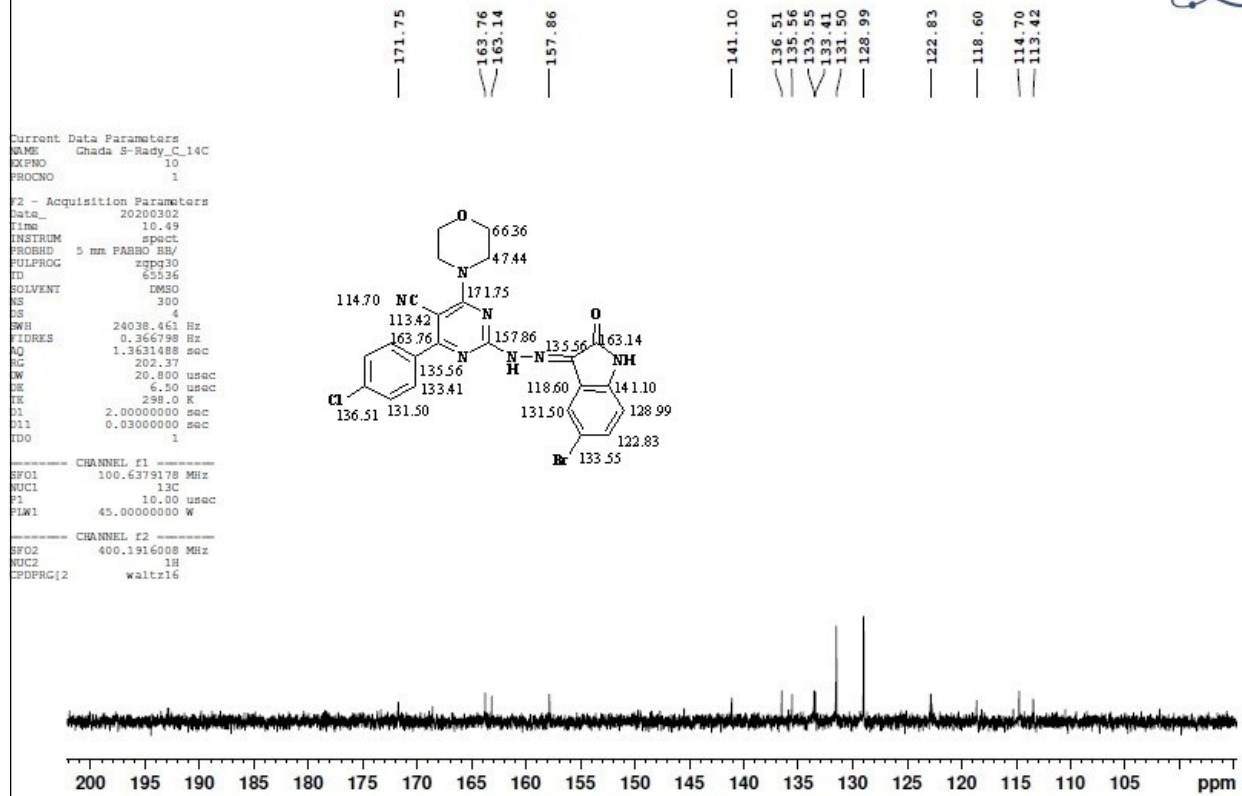


The ¹³C NMR spectrum of compound 11c



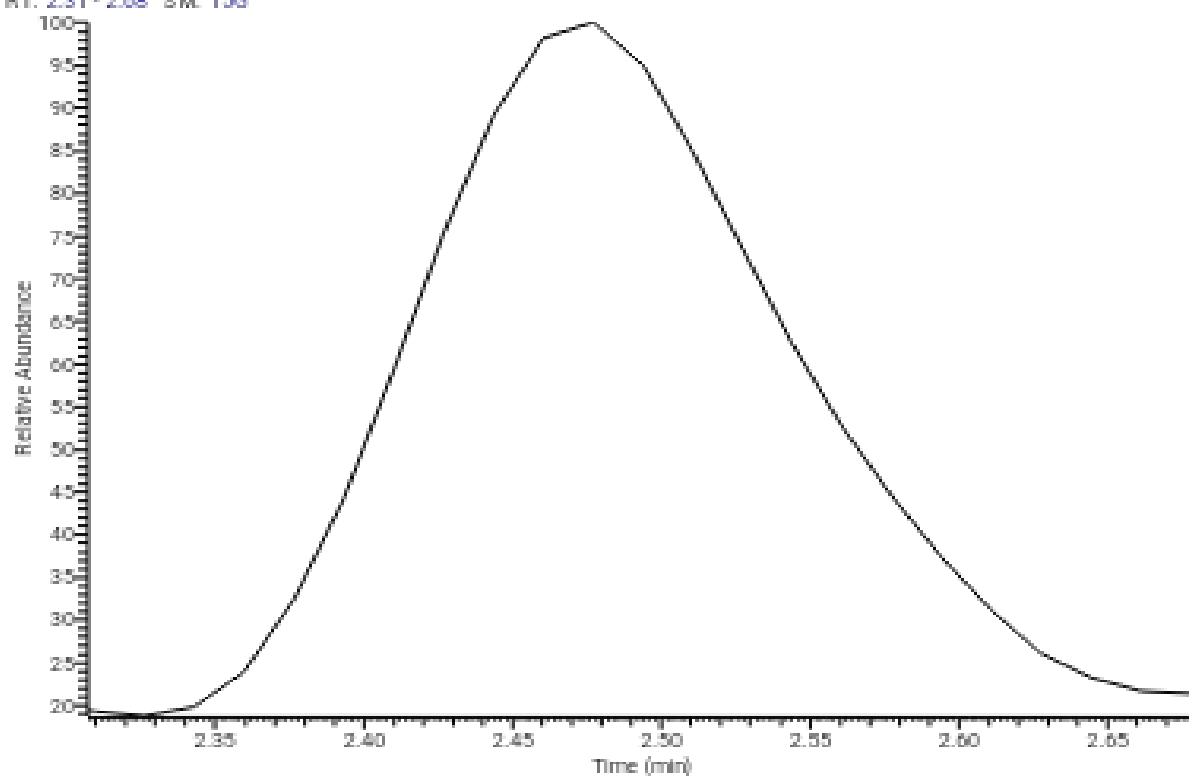
Ghada S-Rady_C_14C

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www.pharma.cu.edu.eg dir-mau.fopcu@pharma.cu.edu.eg



The mass spectrum of compound 11c

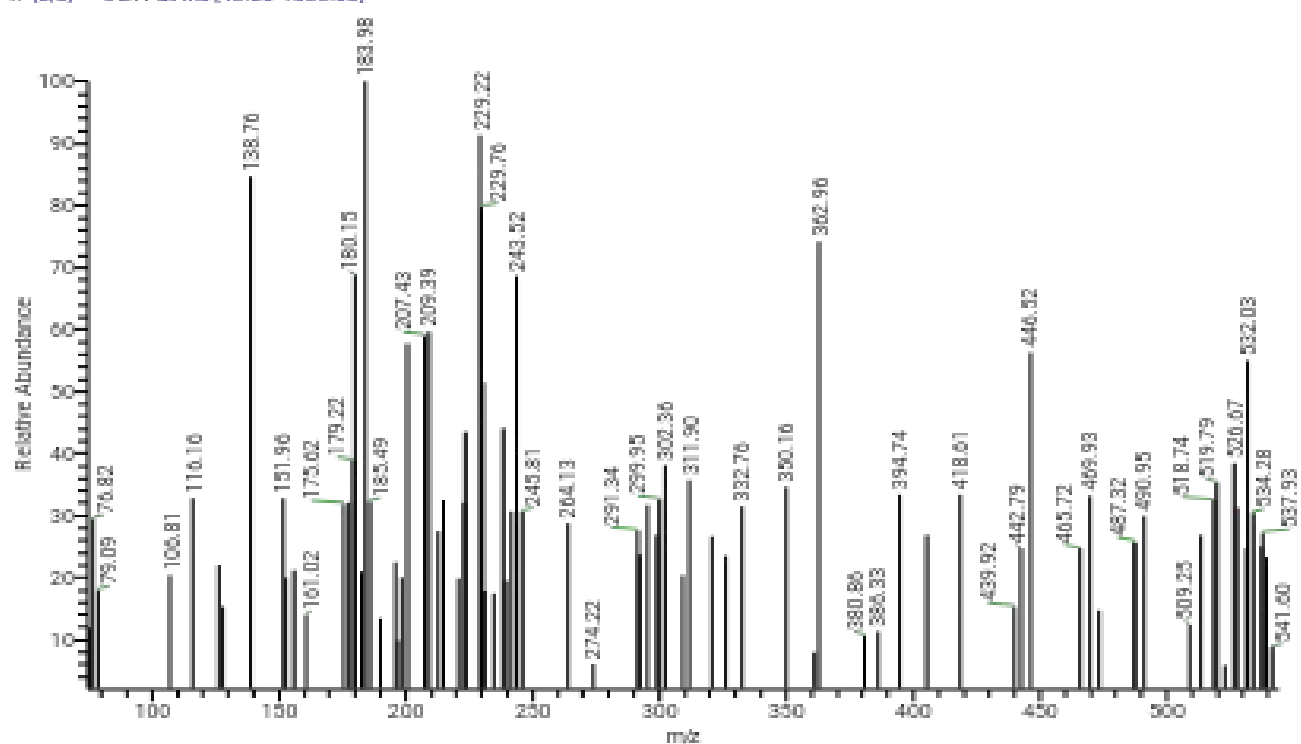
RT: 2.31 - 2.68 SM: 15G



NL:
1.00E4
TIC MS
moshera-
adel-14c_2

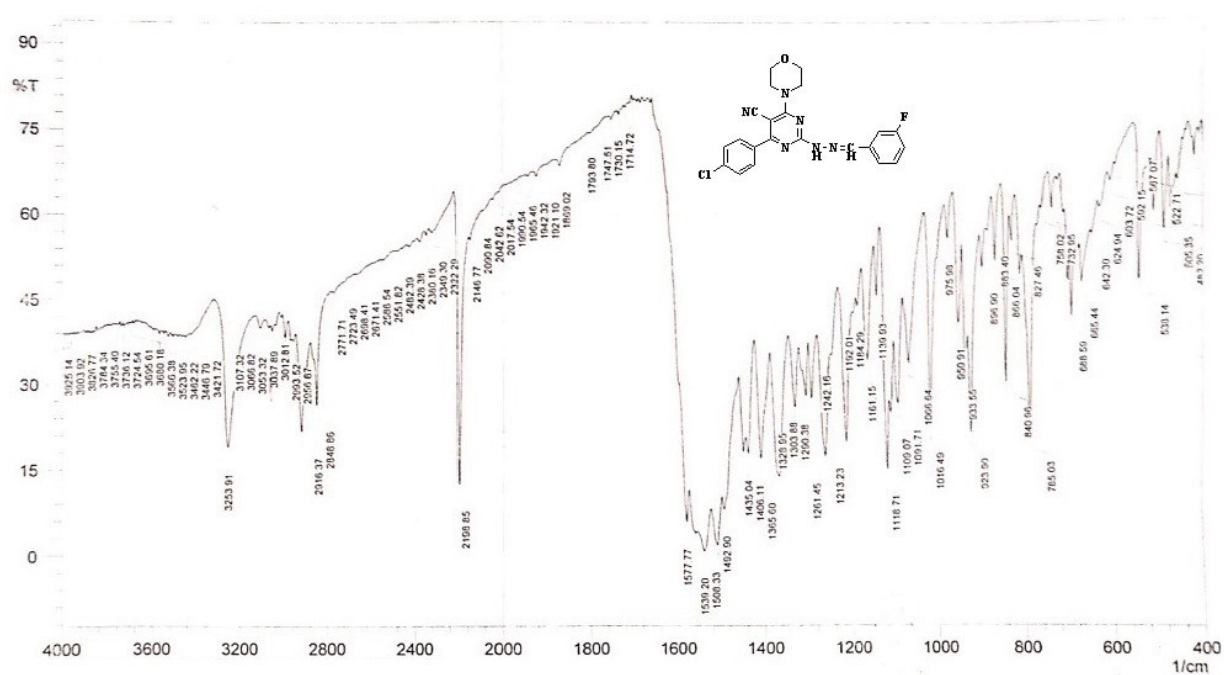
moshera-adel-14c_2 #147 RT: 2.48 AV: 1 SB: 2 3.05, 3.58 NL: 3.69E2

T: {0,0} + c EI Full ms [40.00-1000.00]

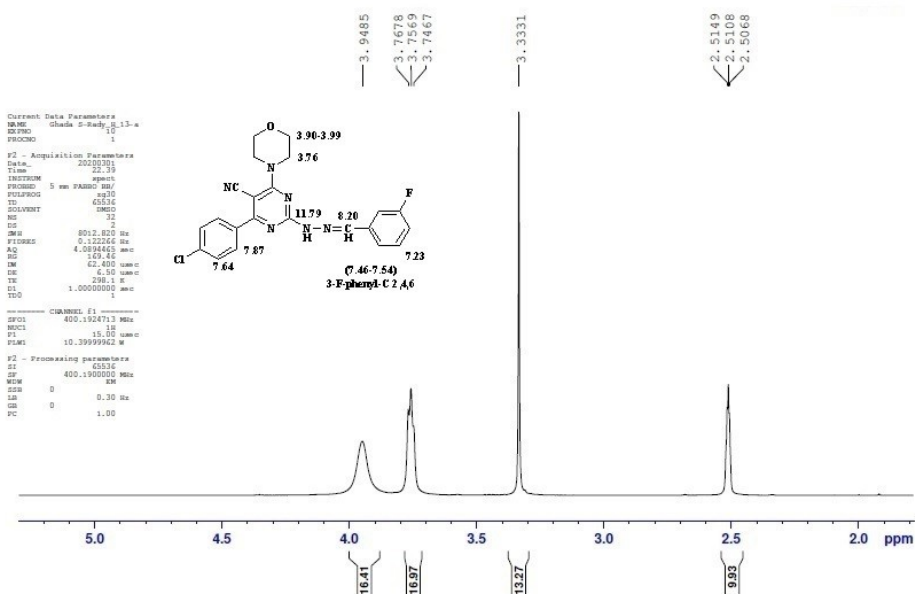
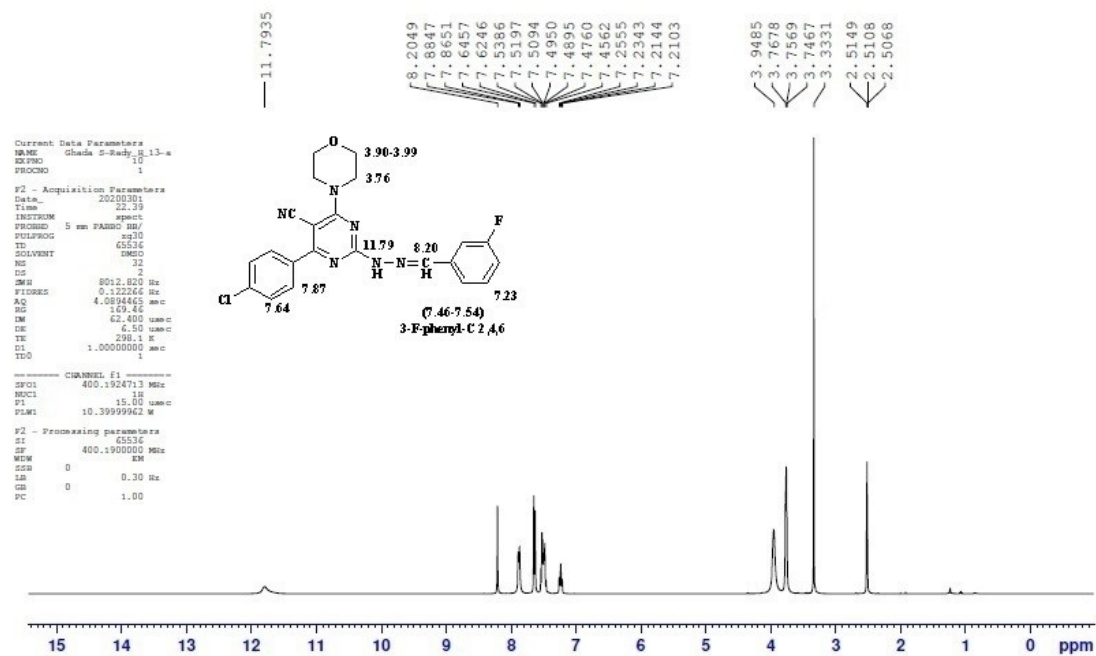


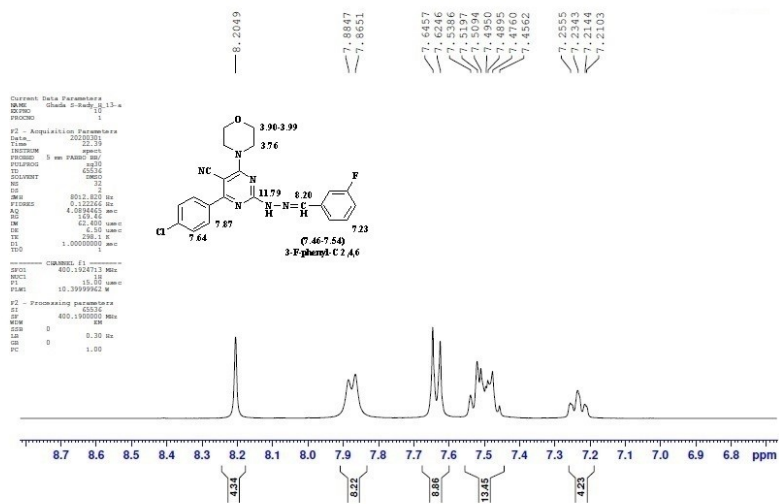
Spectral data of compound 12 a

The IR spectrum of compound 12 a

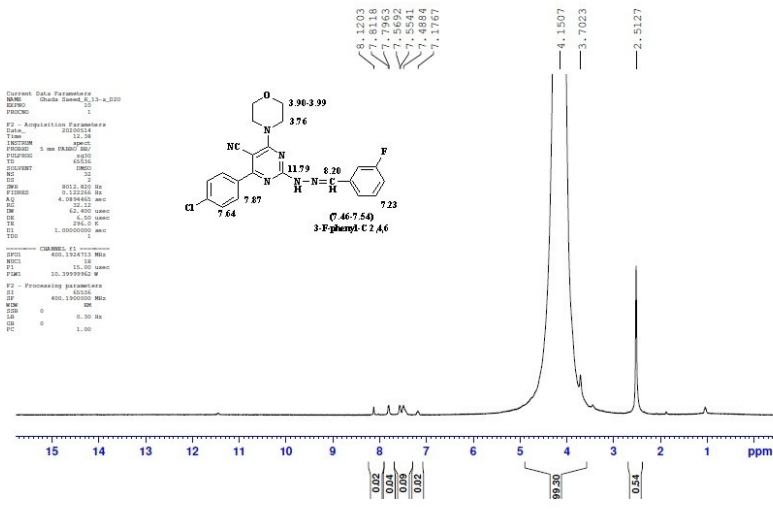


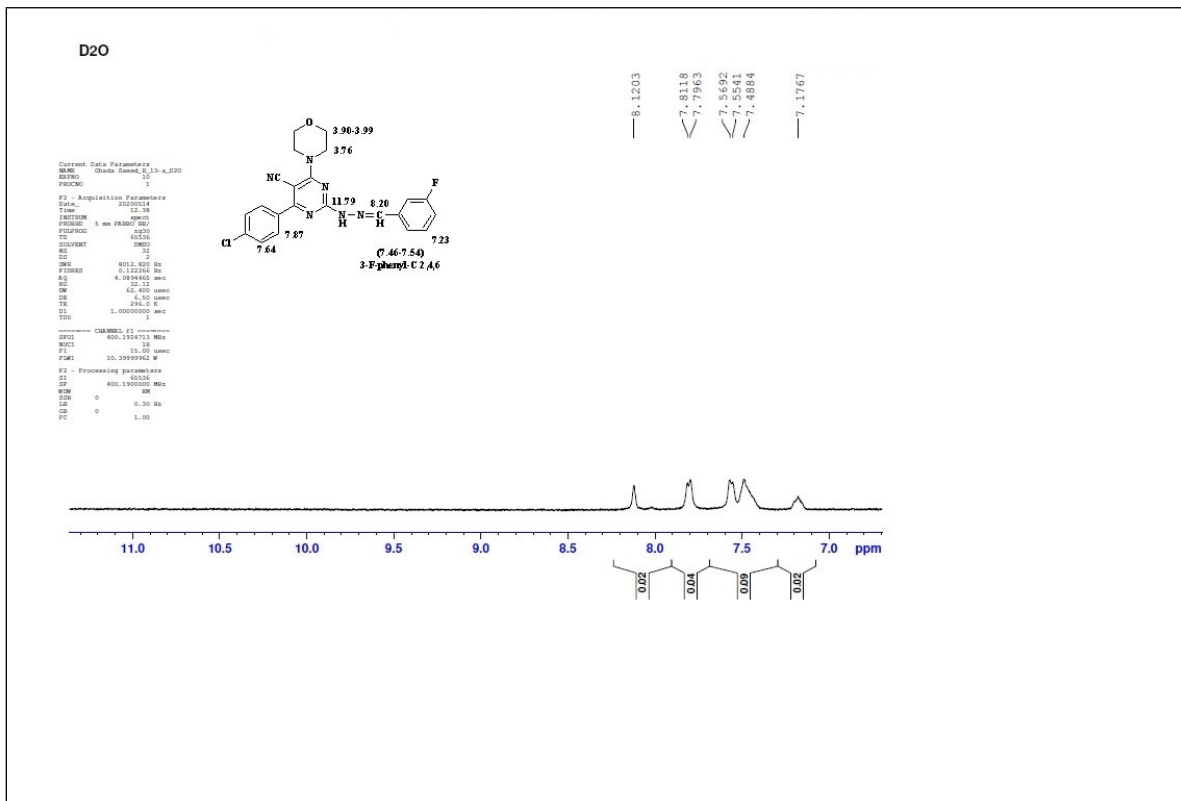
¹H NMR spectrum of compound 12a



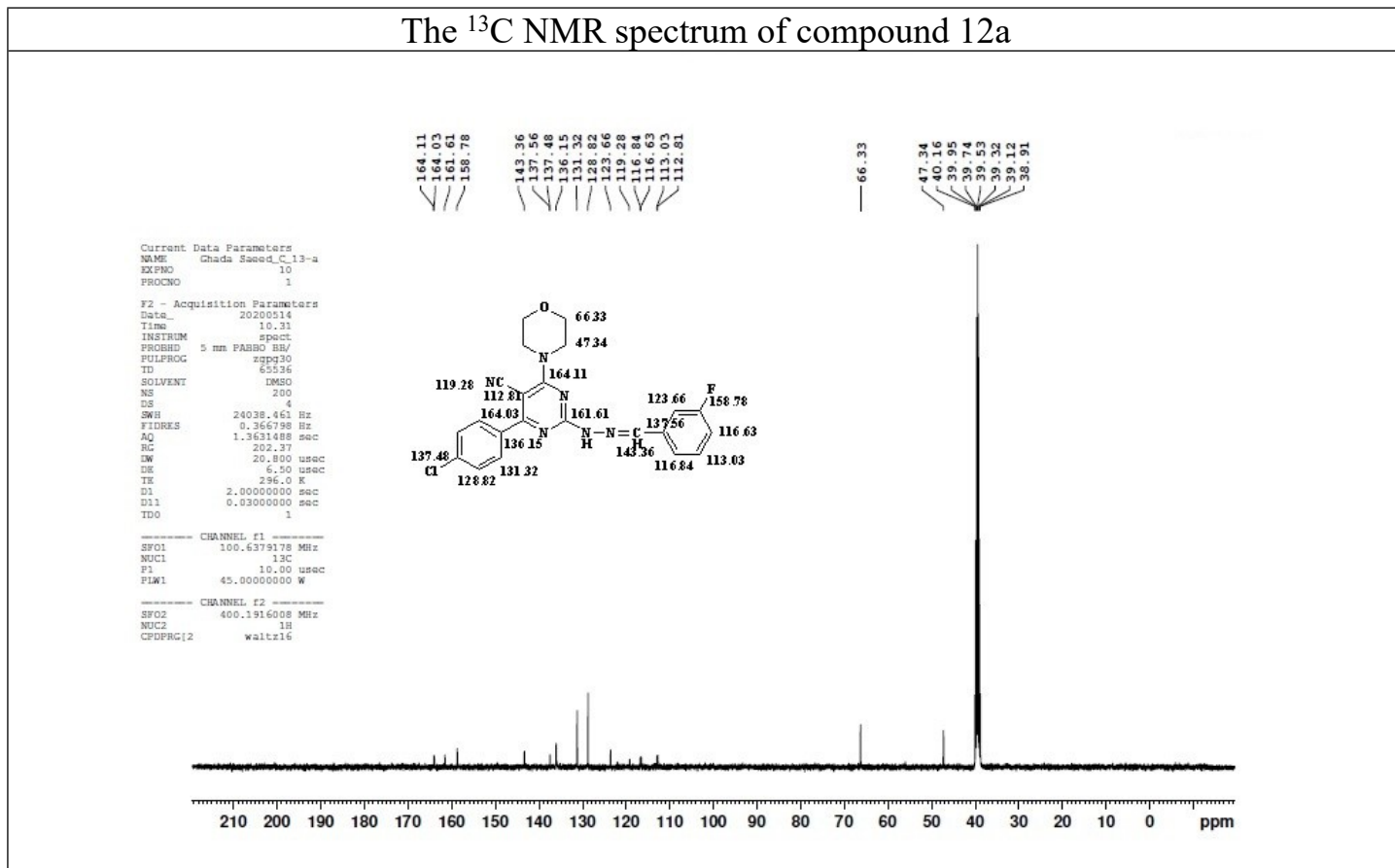


D2O





The ¹³C NMR spectrum of compound 12a

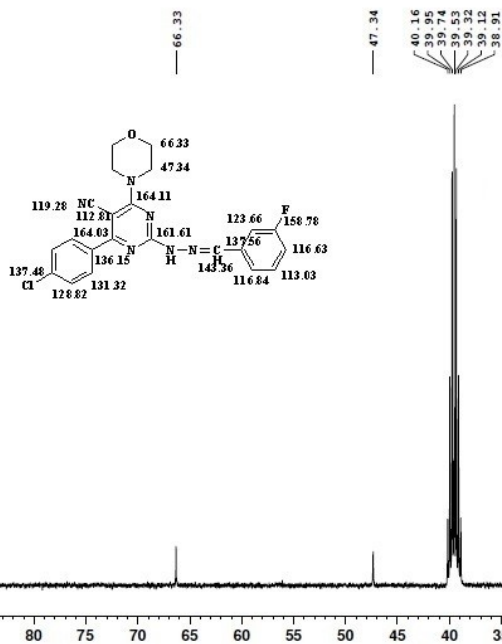


Current Data Parameters
 NAME Gmads Saead_C13-a
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200514
 Time 10.31
 INSTRUM spect
 PROBRD 5 mm PABBO BBI/
 PULPROG zgpg30
 TD 65536
 SOLVENT DMSO
 NS 200
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 202.37
 LW 20.800 usec
 DE 6.50 usec
 TE 296.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

----- CHANNEL f1 -----
 SF01 100.6379178 MHz
 NUC1 13C
 P1 10.00 usec
 PLW1 45.00000000 W

----- CHANNEL f2 -----
 SF02 400.1916008 MHz
 NUC2 1H
 CPDPRG2 waltz16

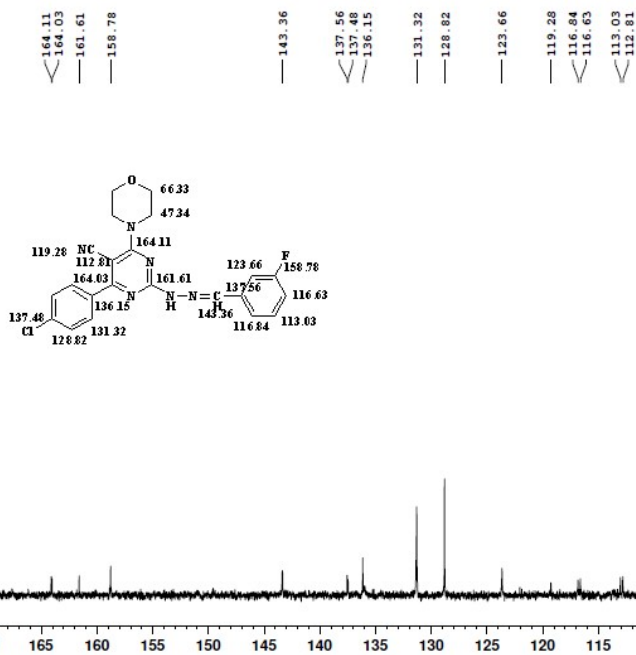


Current Data Parameters
 NAME Gmads Saead_C13-a
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200514
 Time 10.31
 INSTRUM spect
 PROBRD 5 mm PABBO BBI/
 PULPROG zgpg30
 TD 65536
 SOLVENT DMSO
 NS 200
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 202.37
 LW 20.800 usec
 DE 6.50 usec
 TE 296.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

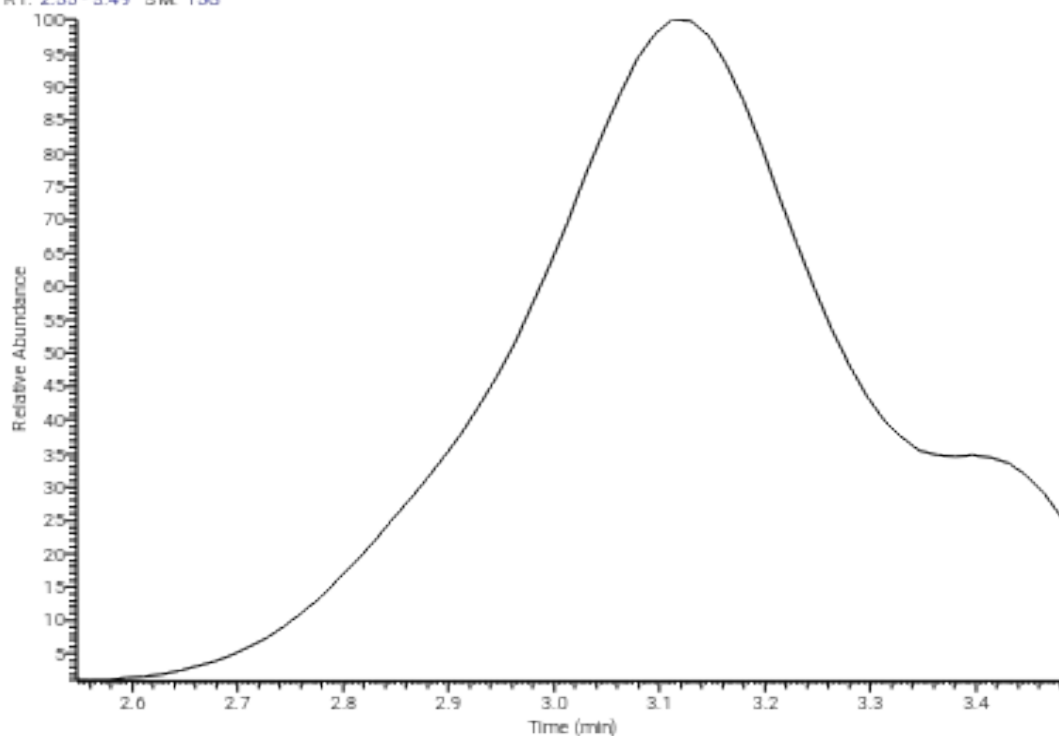
----- CHANNEL f1 -----
 SF01 100.6379178 MHz
 NUC1 13C
 P1 10.00 usec
 PLW1 45.00000000 W

----- CHANNEL f2 -----
 SF02 400.1916008 MHz
 NUC2 1H
 CPDPRG2 waltz16

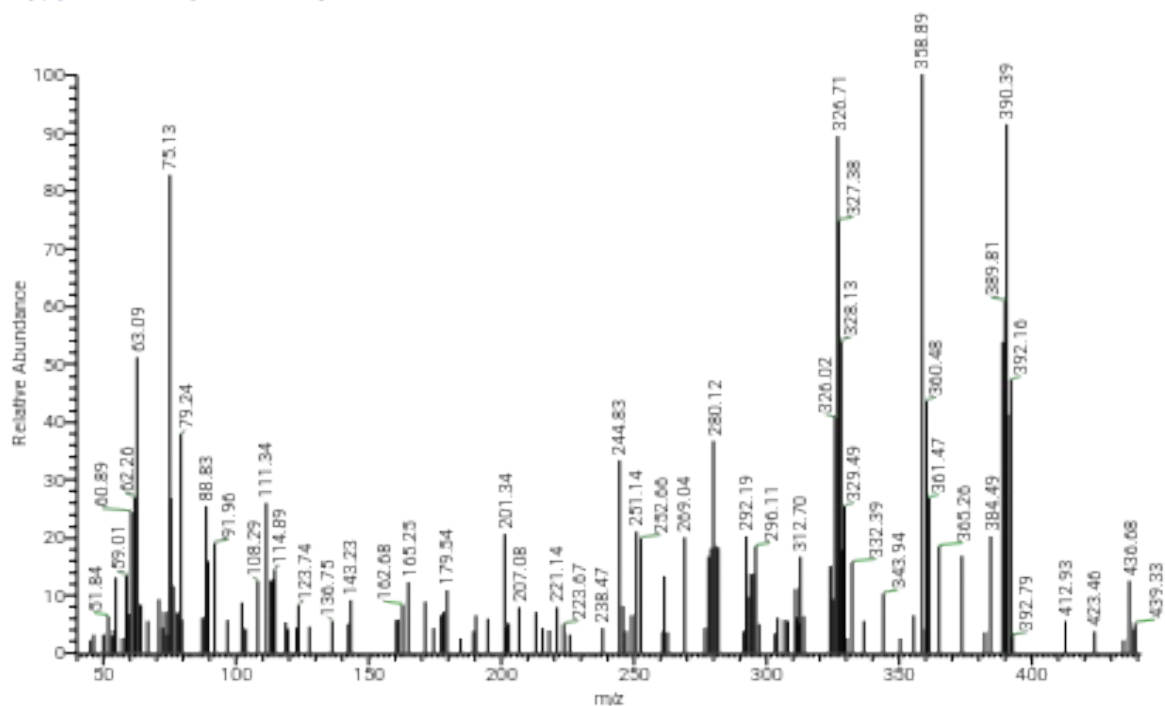


The mass spectrum of compound 12a

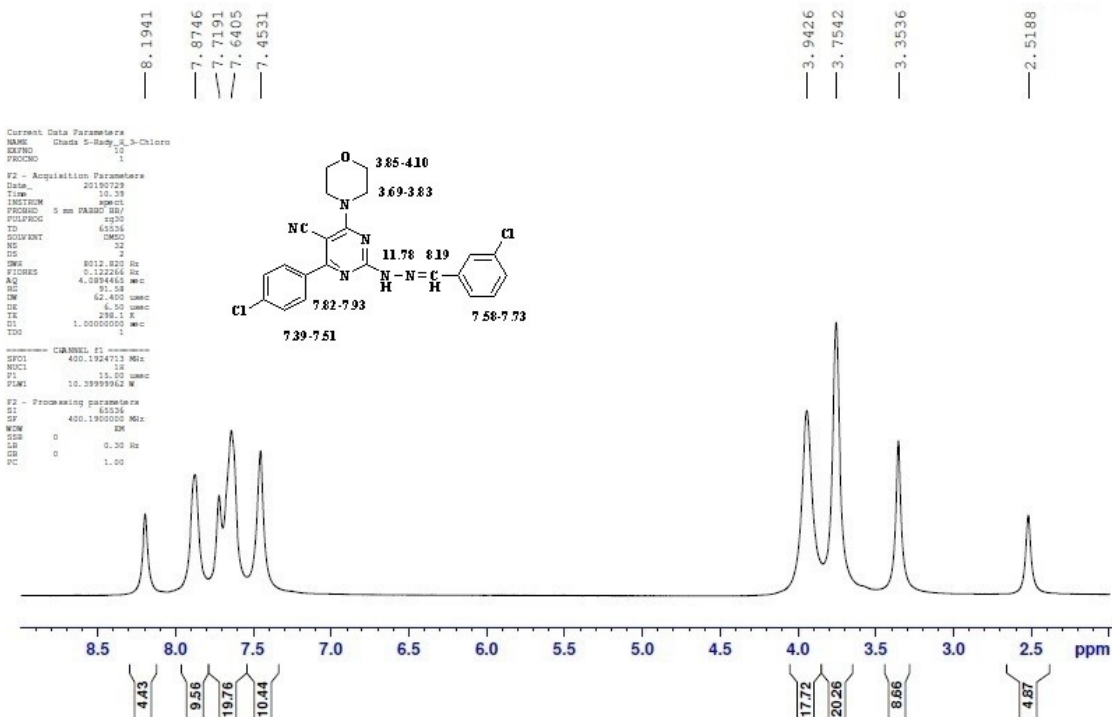
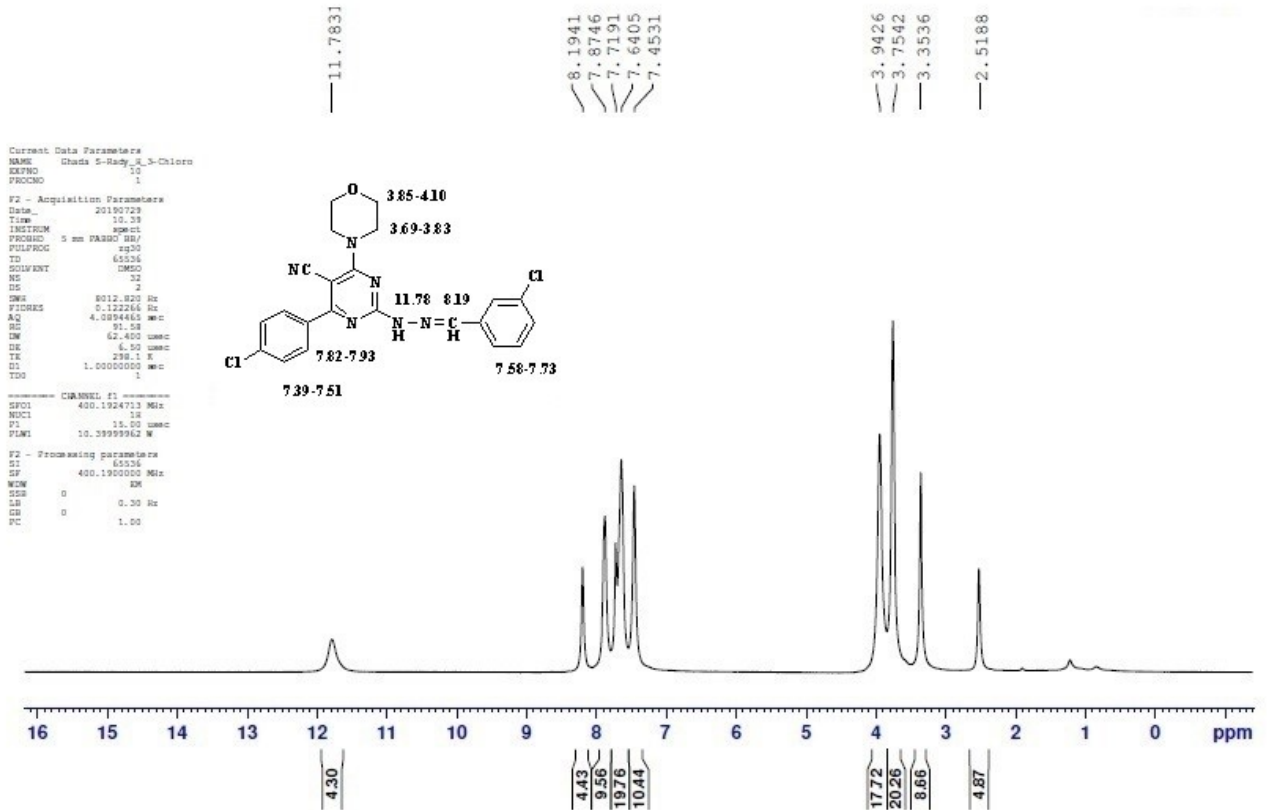
RT: 2.55 - 3.49 SM: 15G



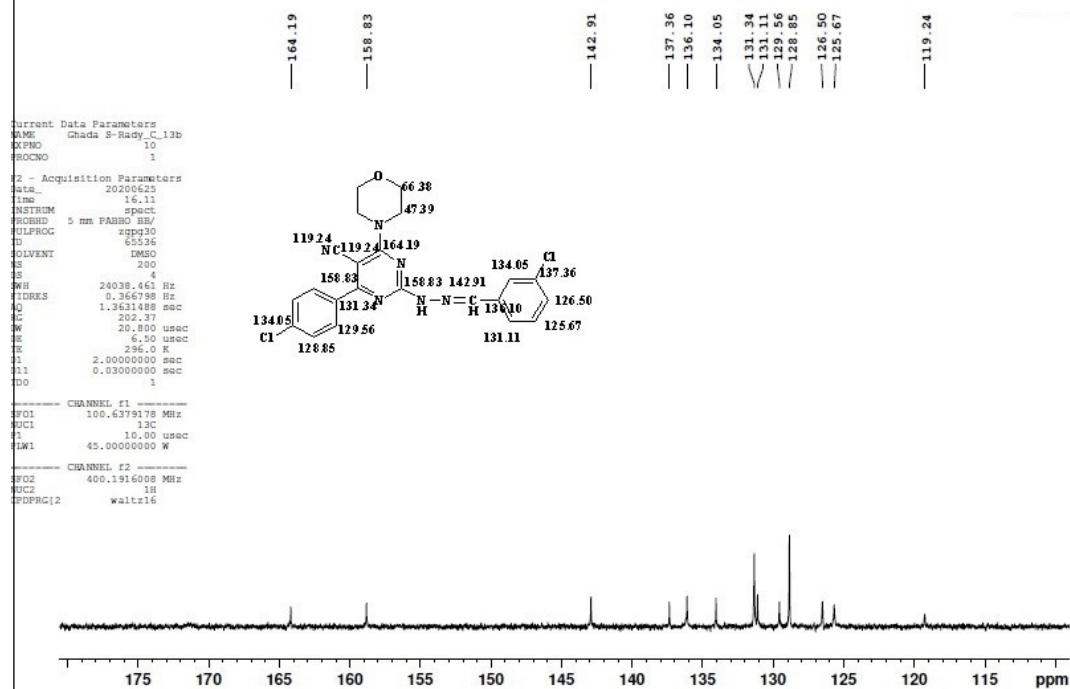
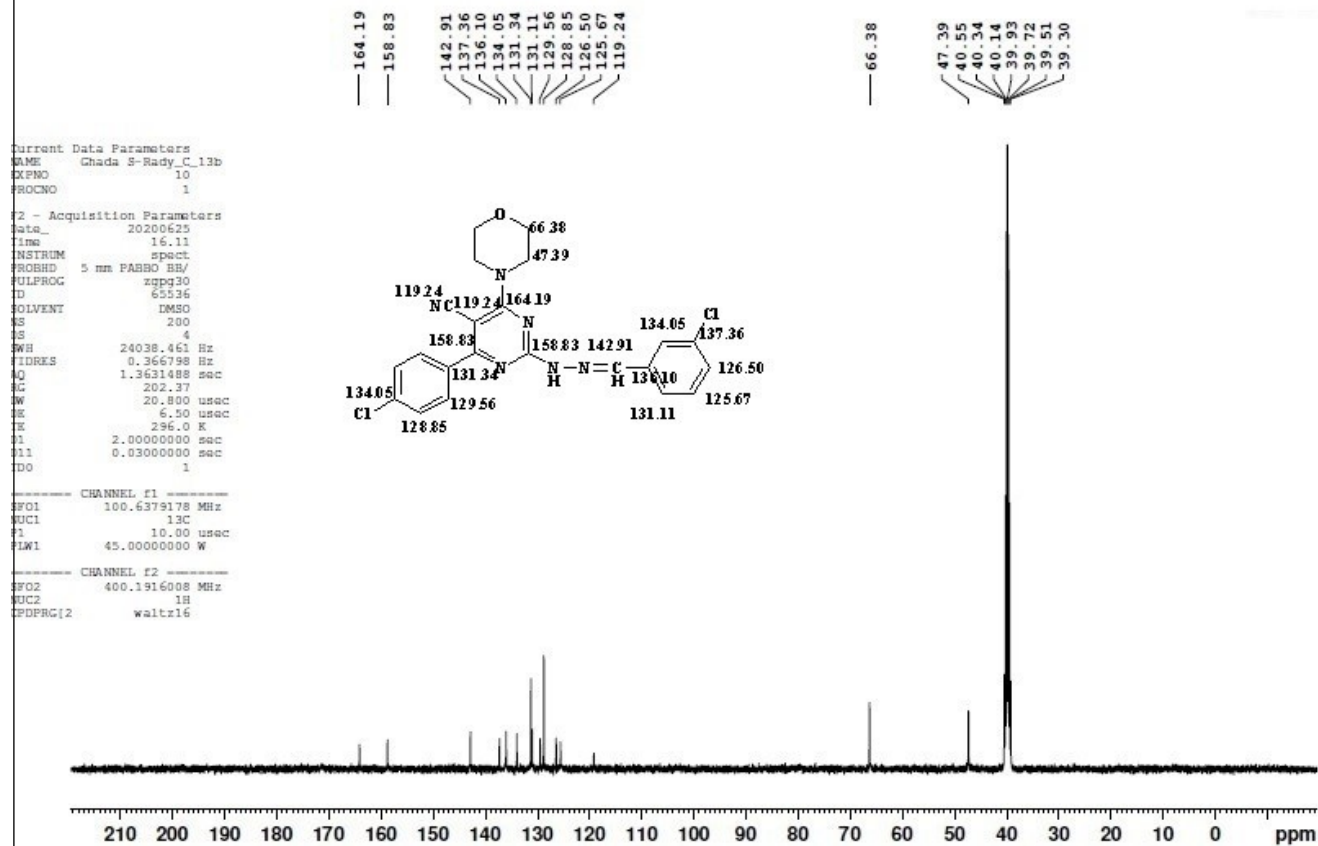
moshera-13a #225 RT: 3.78 AV: 1 SB: 2 4.35, 4.35 NL: 2.76E3
T: {0,0} + cEI Full ms [40.00-1000.00]



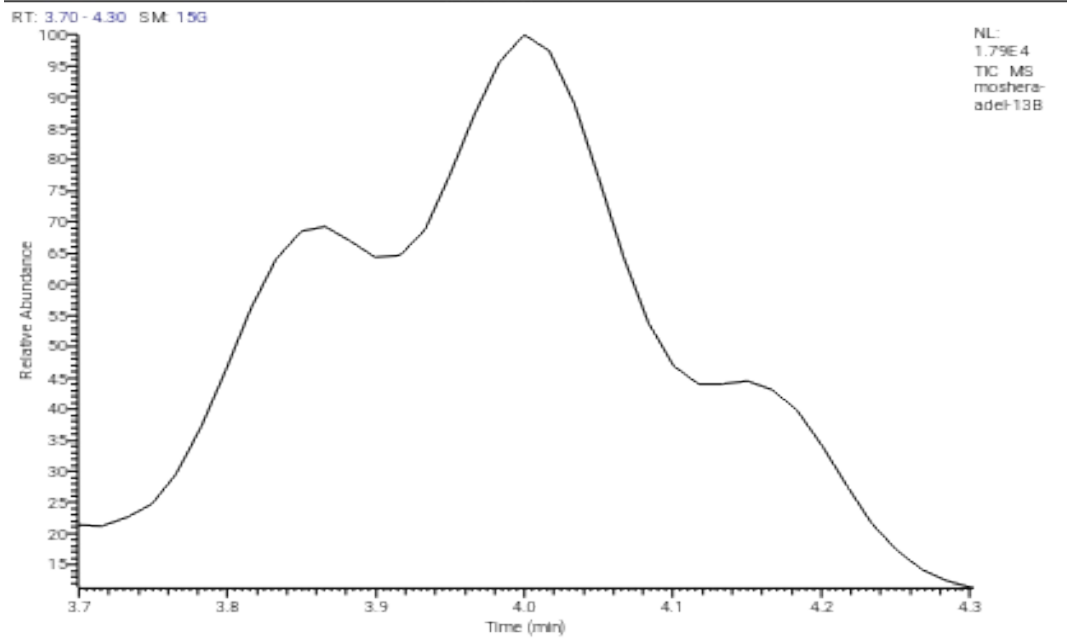
The ¹H NMR spectrum of compound 12b



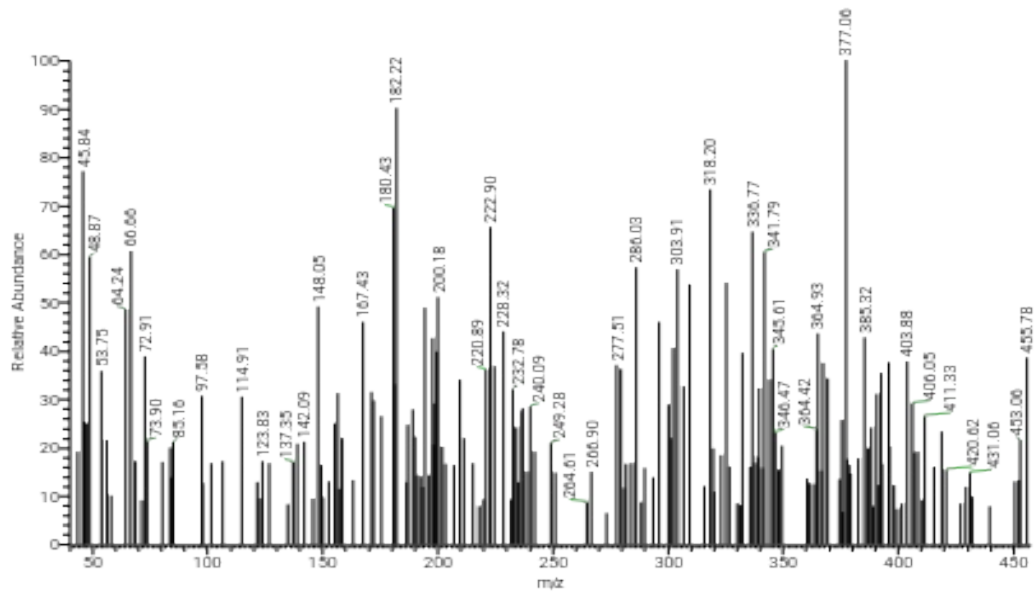
The ¹³C NMR spectrum of compound 12b



The mass spectrum of compound 12b

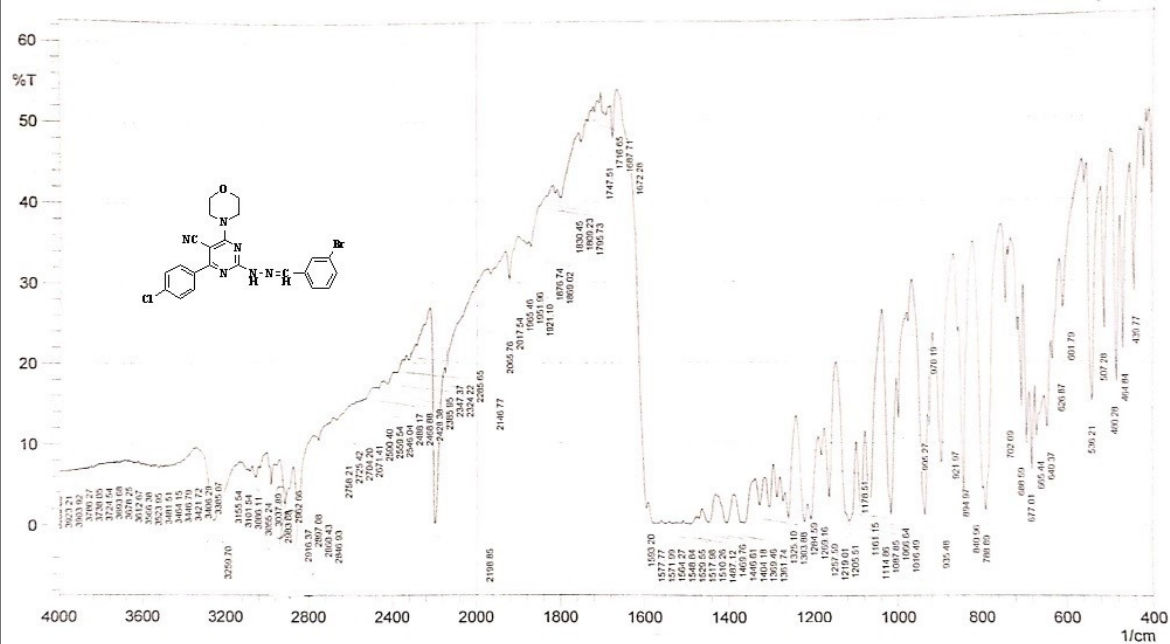


moshera-adel-13B #160 RT: 2.69 AV: 1 SB: 2 4.45, 4.45 NL: 5.09E2
T: {0,0} + c EI Full ms [40.00-1000.00]

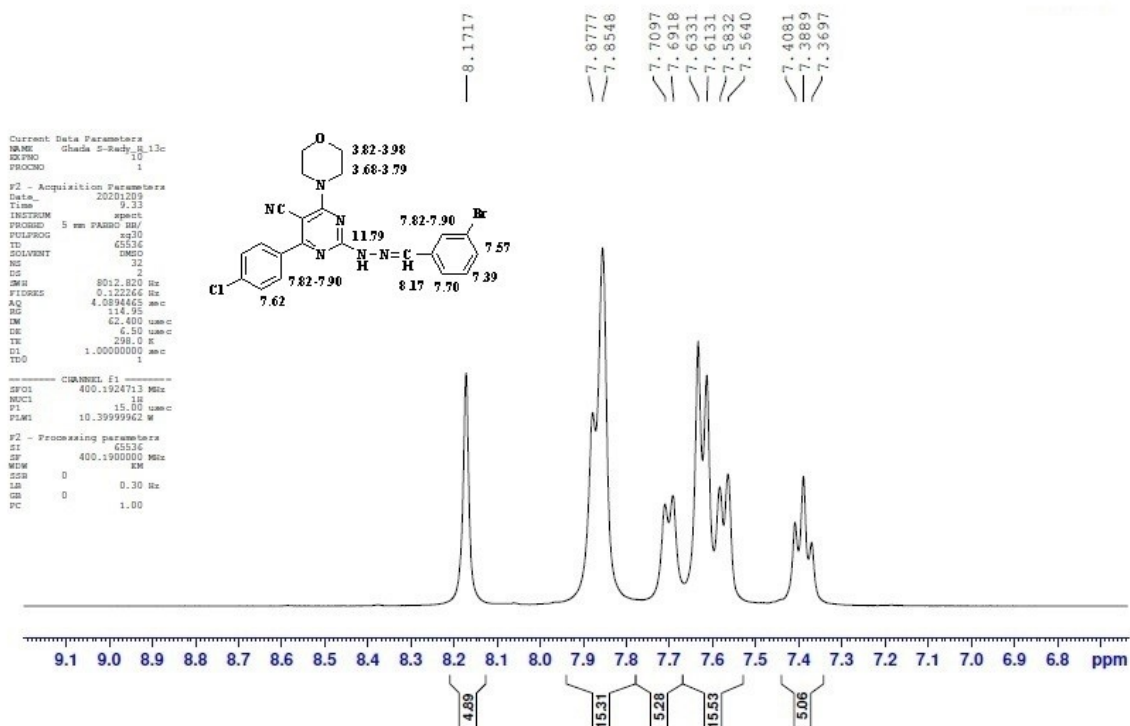
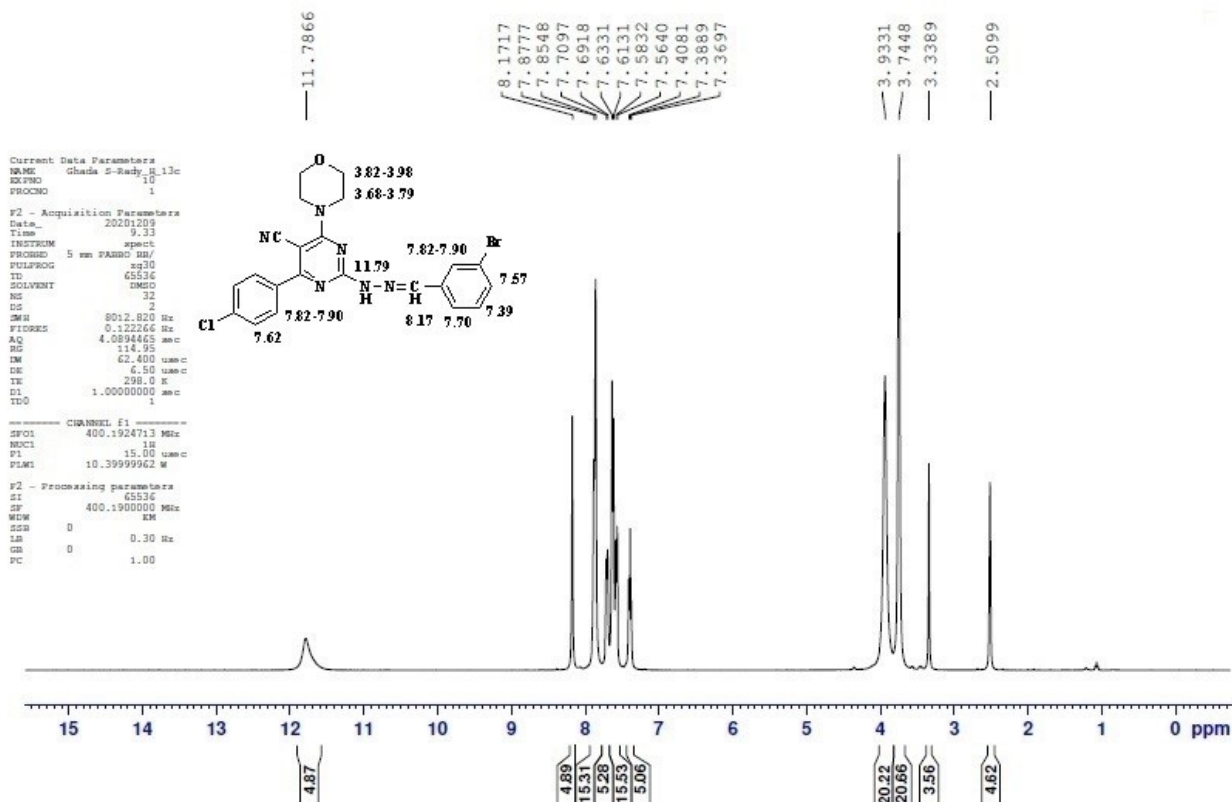


Spectral data of compound 12c

The IR spectrum of compound 12c



The ¹H NMR spectrum of compound 12c



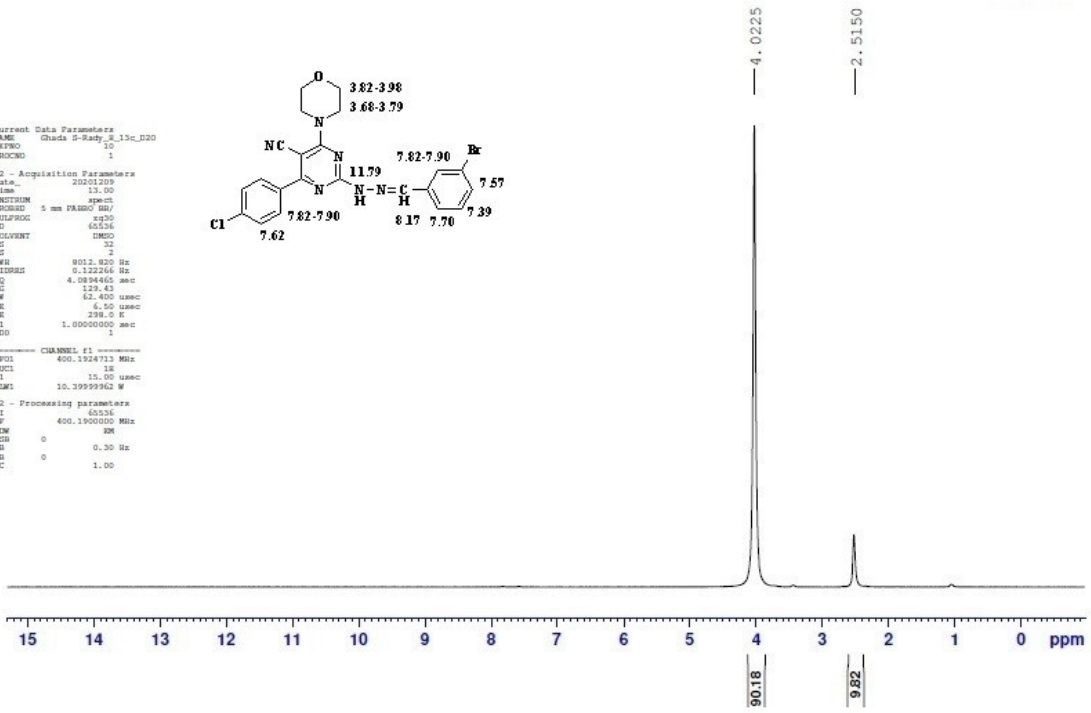
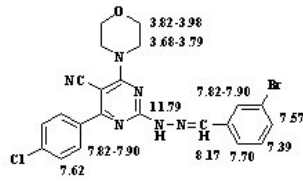
D2O

Current Data Parameters
NAME Qhadi 5-Rady_8_13c_D2O
EXPNO 10
PROCNO 1

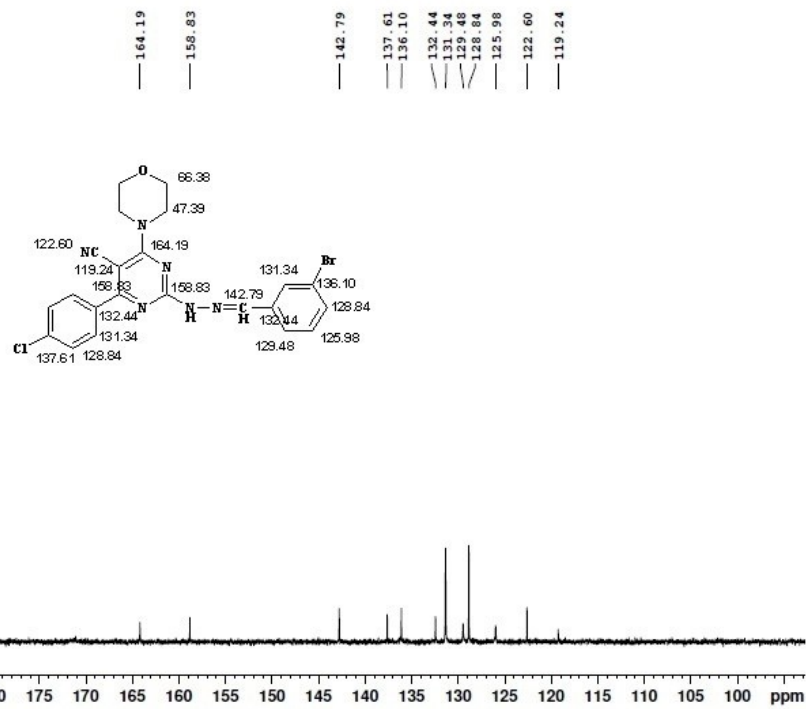
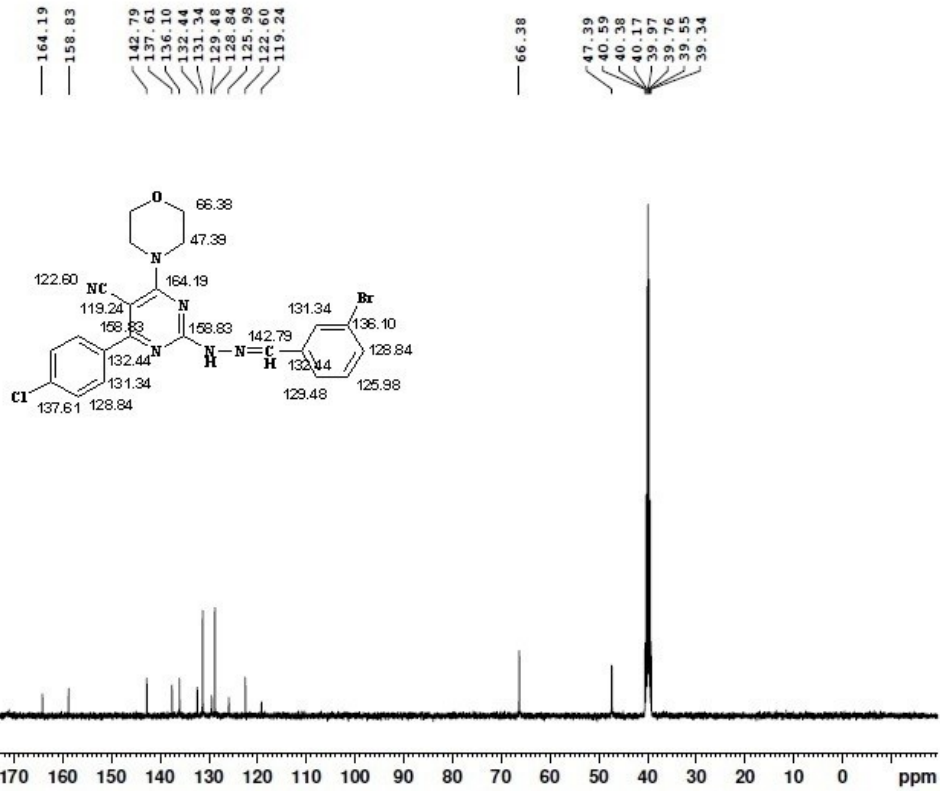
F2 - Acquisition Parameters
Date_ 20201209
Time 13.00
INSTRUM spect
PROBHD 5 mm PABBO BH/1
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 2
DS 2
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894665 sec
RG 129.43
DM 62.400 usec
DE 4.50 usec
TE 298.0 K
D1 1.0000000 sec
TD0 1

===== CHANNEL f1 =====
SFO1 400.1924713 MHz
NUC1 13
P1 15.00 usec
P1M1 10.3999962 W

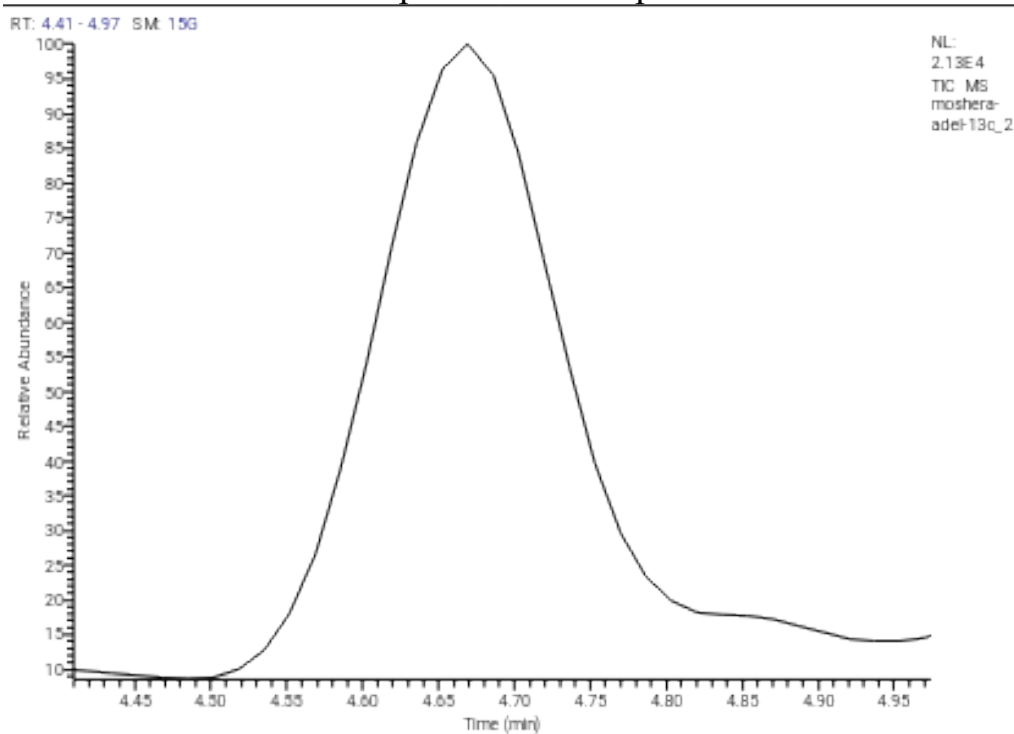
F2 - Processing parameters
SI 65536
SF 400.1900000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



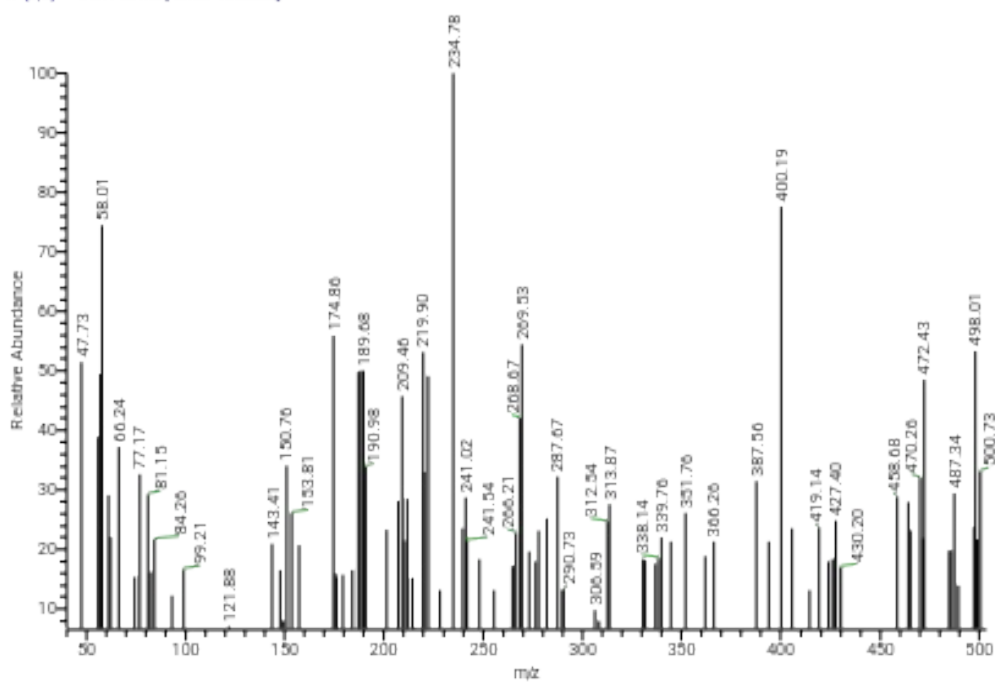
The ¹³C NMR spectrum of compound 12c



The mass spectrum of compound 12c

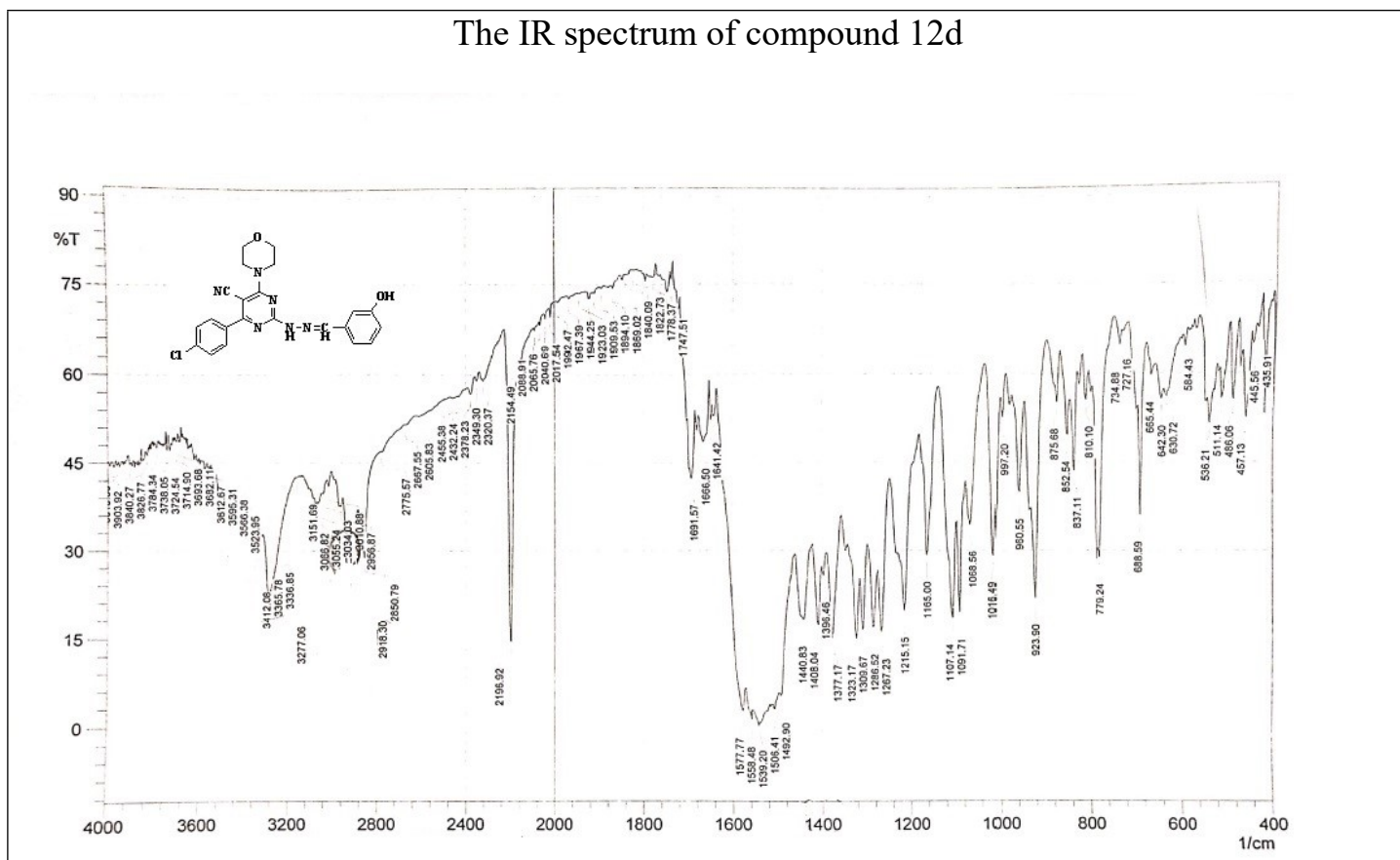


moshera-adel-13c_2 #204 RT: 3.43, AV: 1 SB: 2 4.45, 4.45 NL: 4.33E2
T: {0,0} + c EI Full ms [40.00-1000.00]

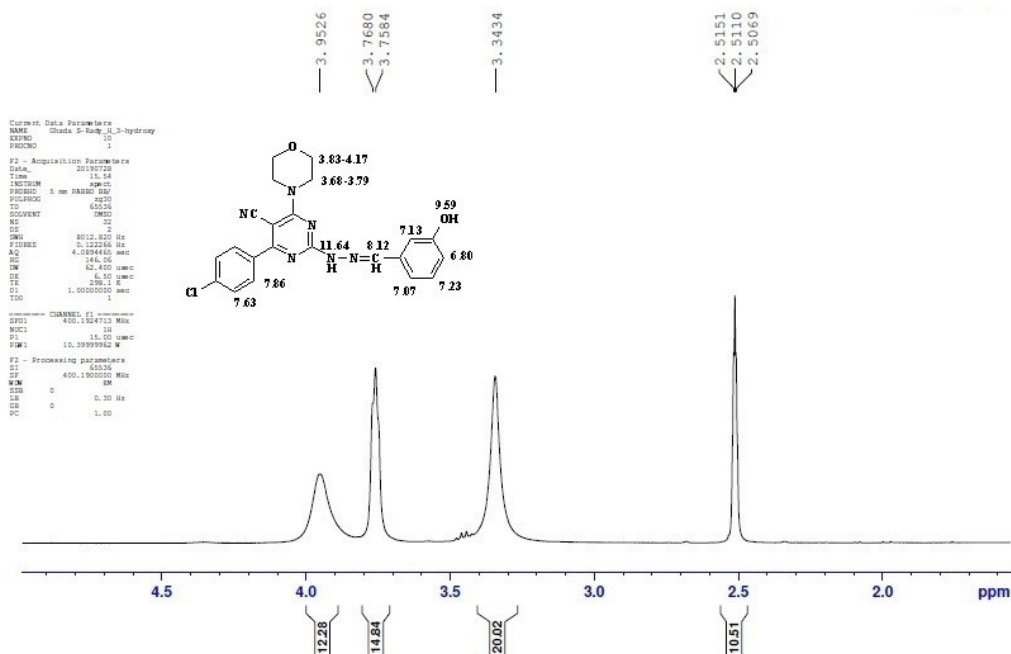
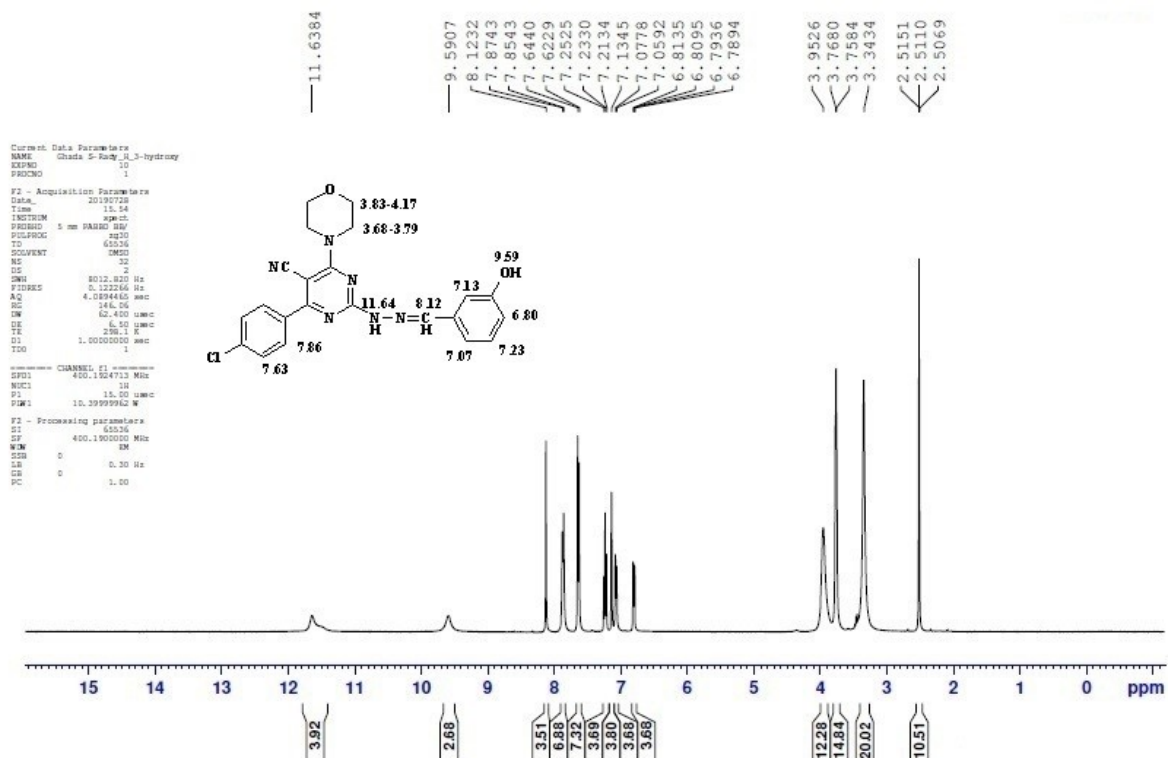


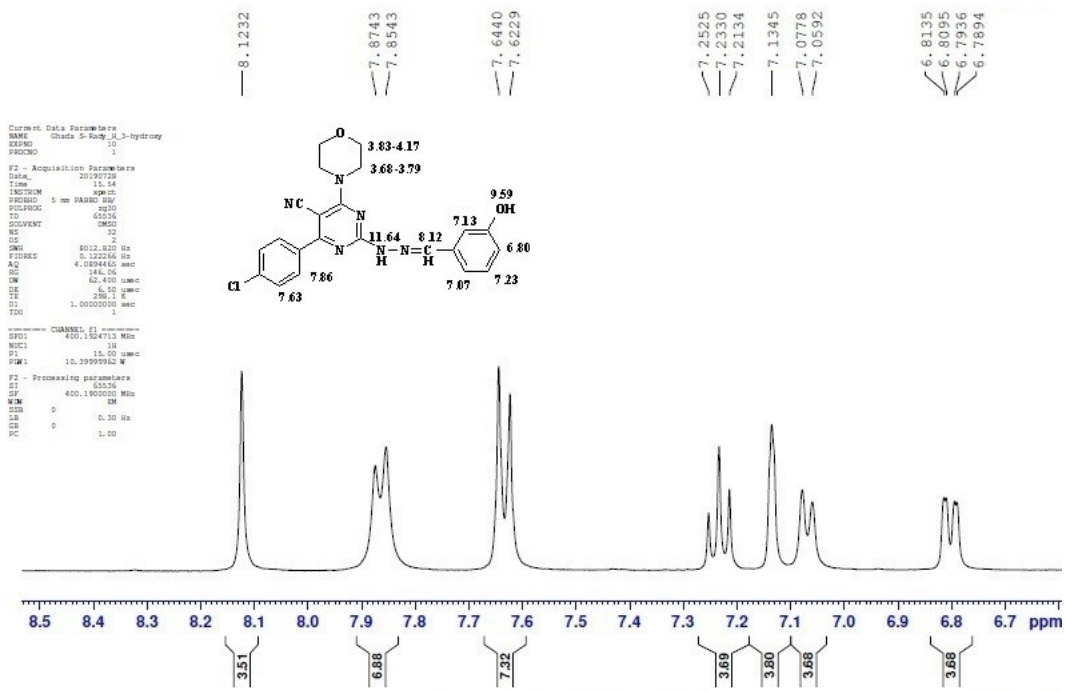
Spectral data of compound 12d

The IR spectrum of compound 12d

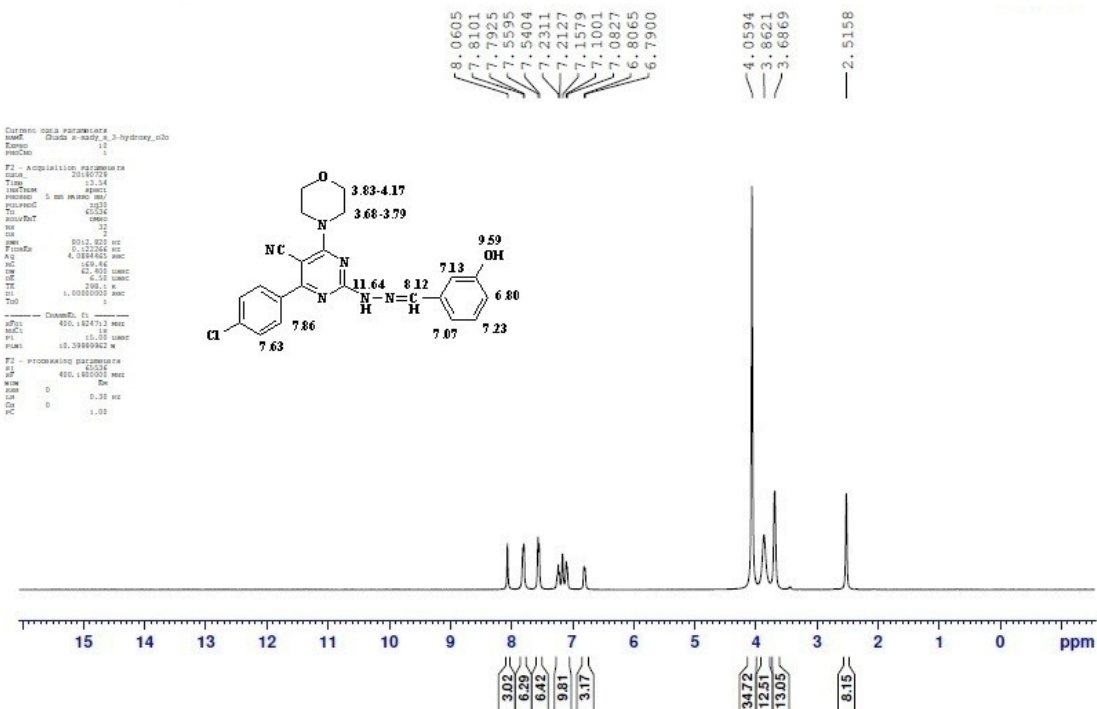


The ¹H NMR spectrum of compound 12d

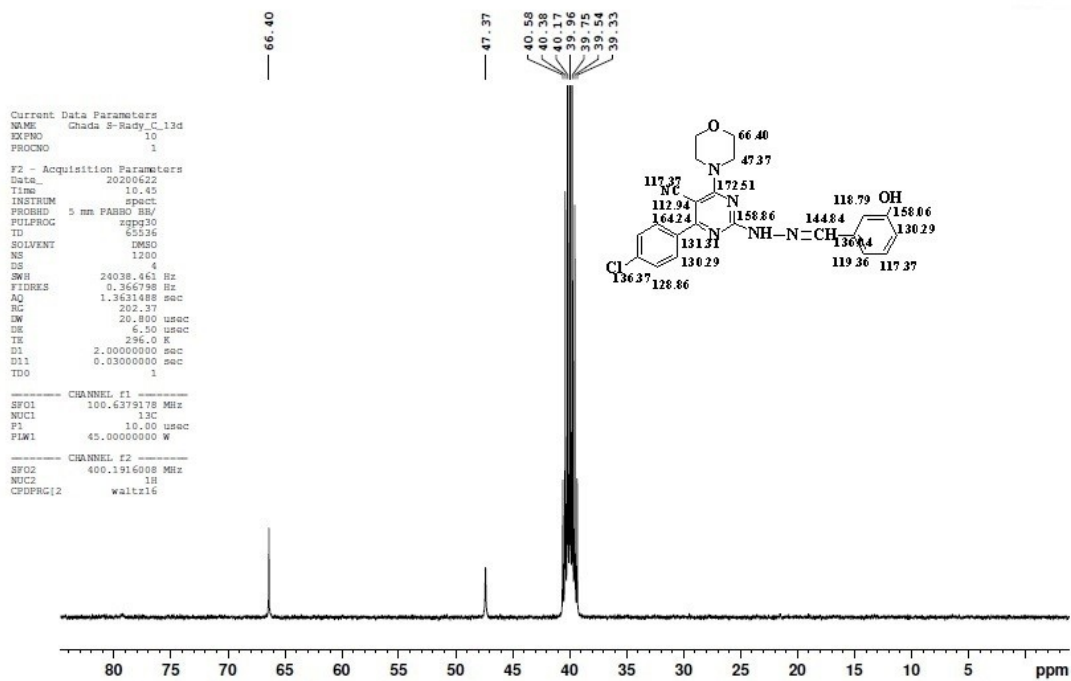
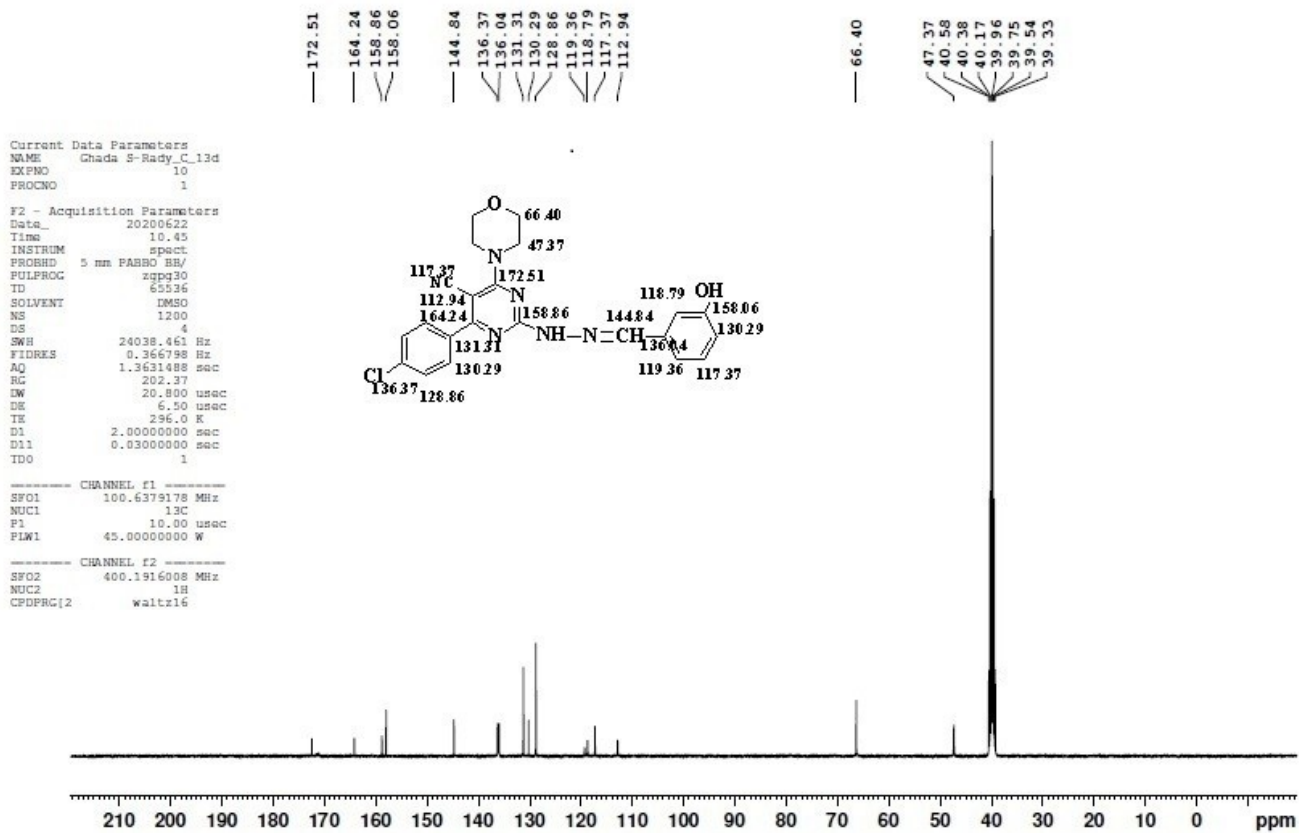




D2O



The ¹³C NMR spectrum of compound 12d

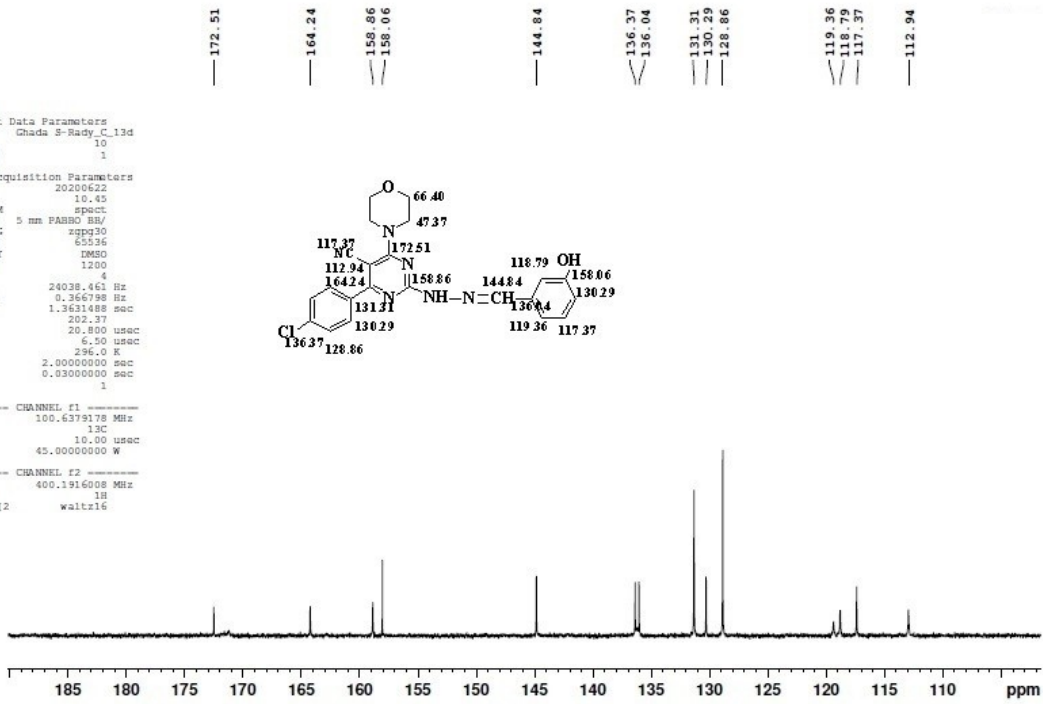
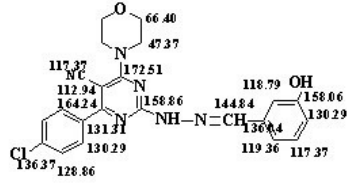


Current Data Parameters
 NAME Chada S-Rady_C_13d
 EXPNO 10
 PROCNO 1

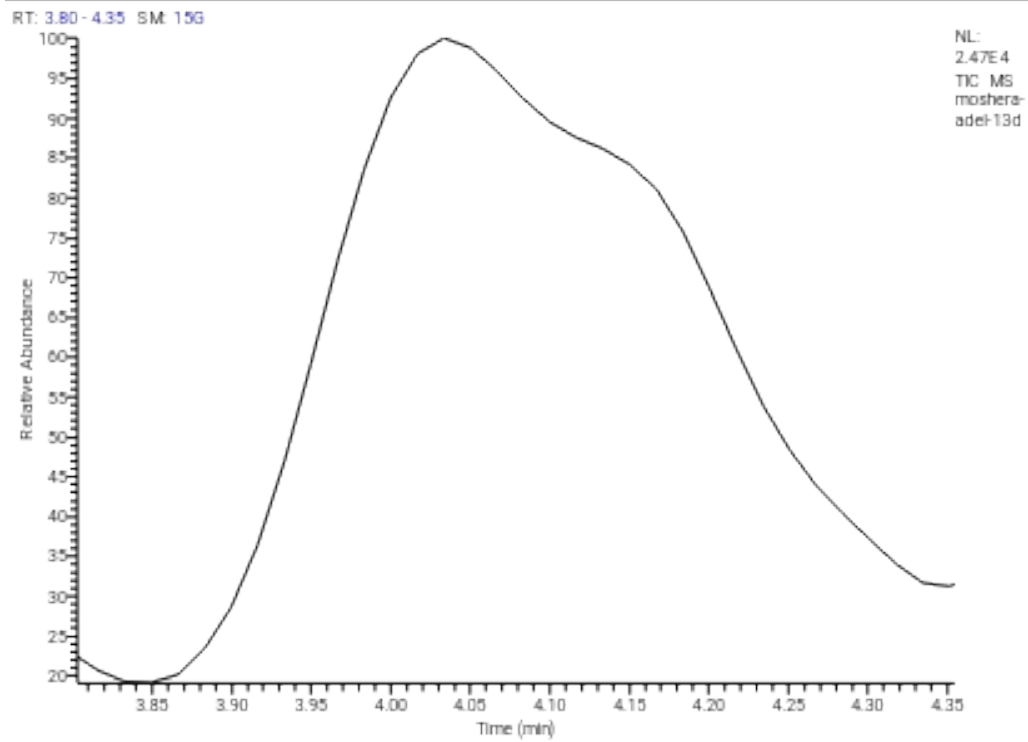
F2 - Acquisition Parameters
 Date_ 20200622
 Time 10.45
 INSTRUM spect
 PROBRD 5 mm PABBO BB/
 PULPROG zgpg30
 ID 55336
 SOLVENT DMSO
 NS 1200
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.363188 sec
 RG 202.37
 DW 20.800 usec
 DE 6.50 usec
 TE 296.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 ID0 1

----- CHANNEL f1 -----
 SFO1 100.6379178 MHz
 NUC1 13C
 P1 10.00 usec
 PLW1 45.00000000 W

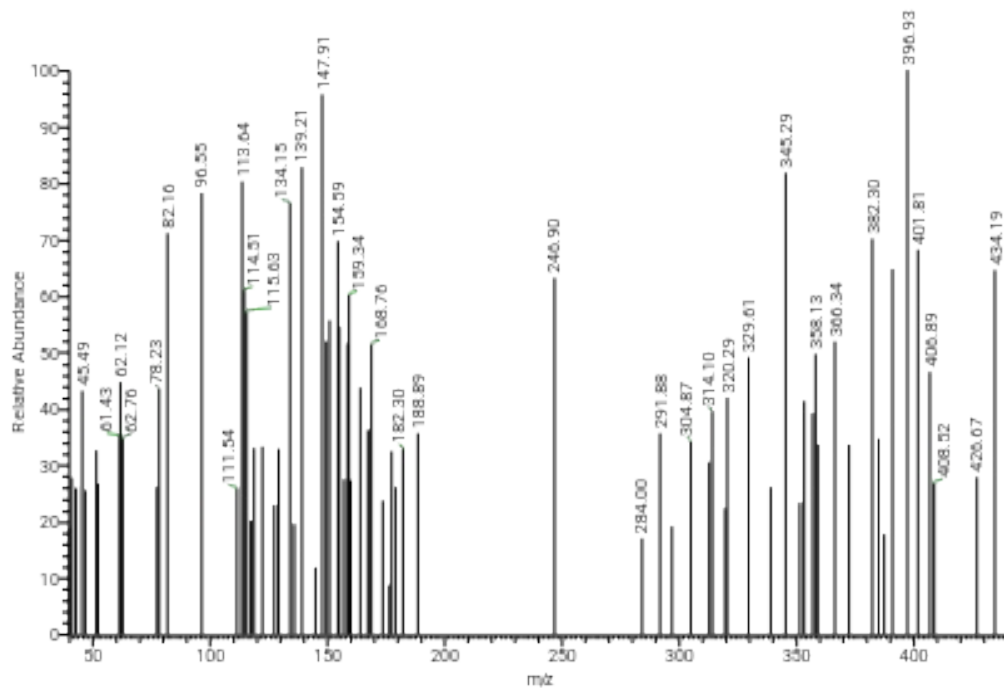
----- CHANNEL f2 -----
 SFO2 400.1916008 MHz
 NUC2 1H
 CPDPRG2 waltz16



The mass spectrum of compound 12d

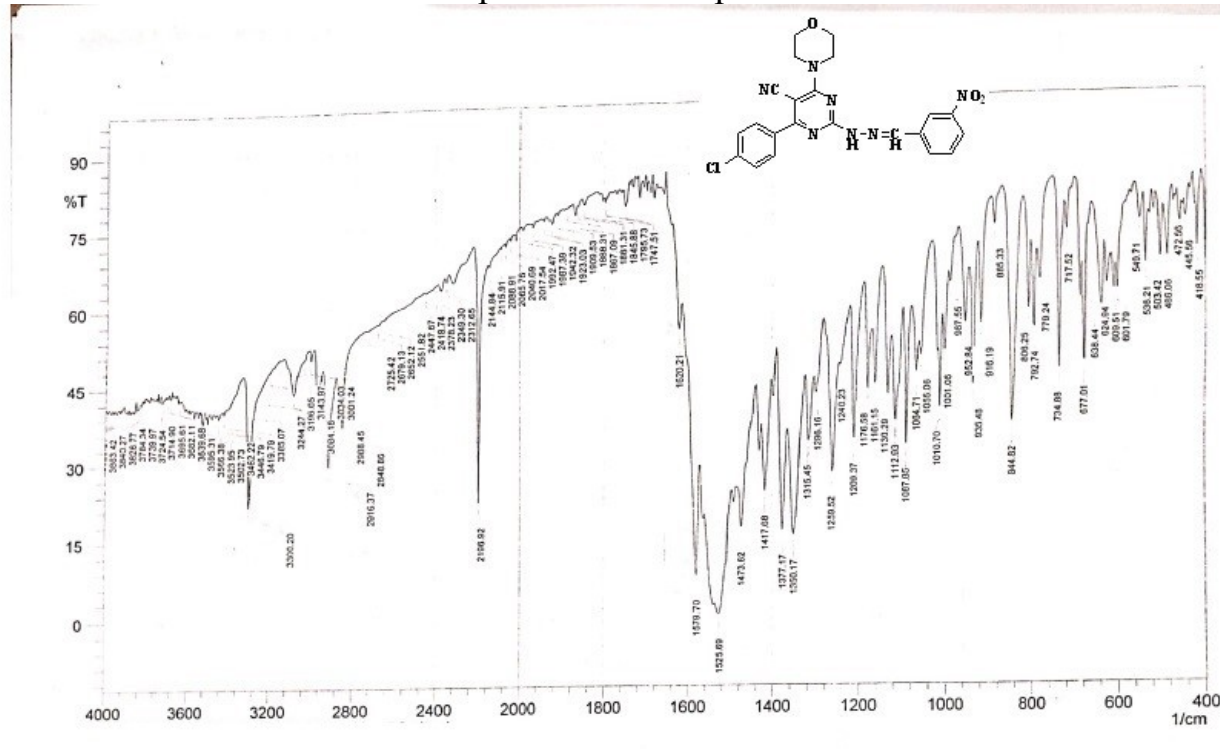


moshera-adel-13d #73 RT: 1.24 AV: 1 SB: 2 4.45, 4.45 NL: 2.81E2
T: {0,0} + c EI Full ms [40.00-1000.00]

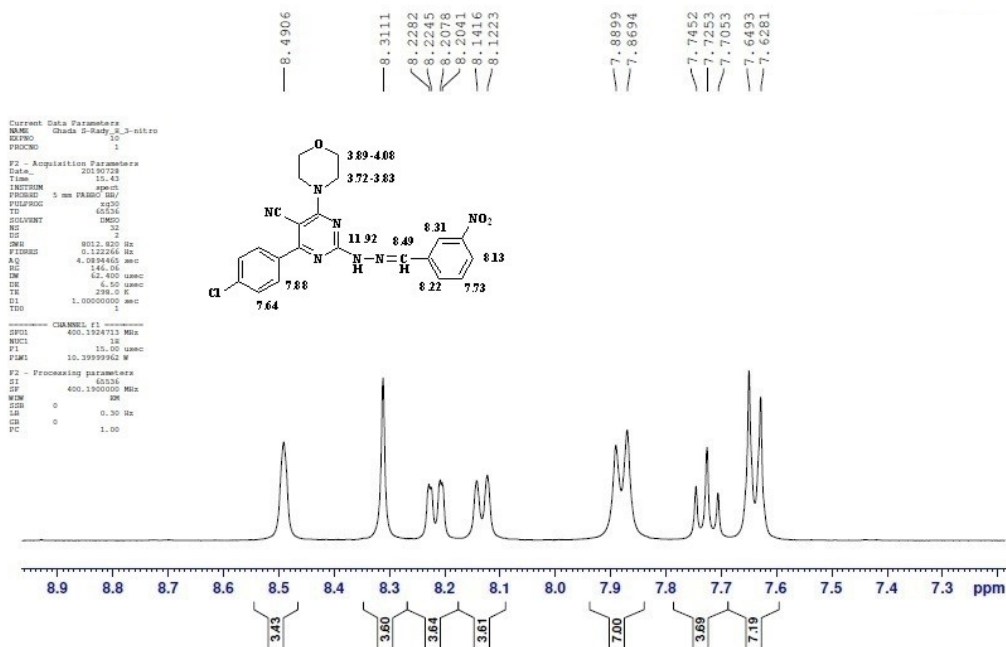
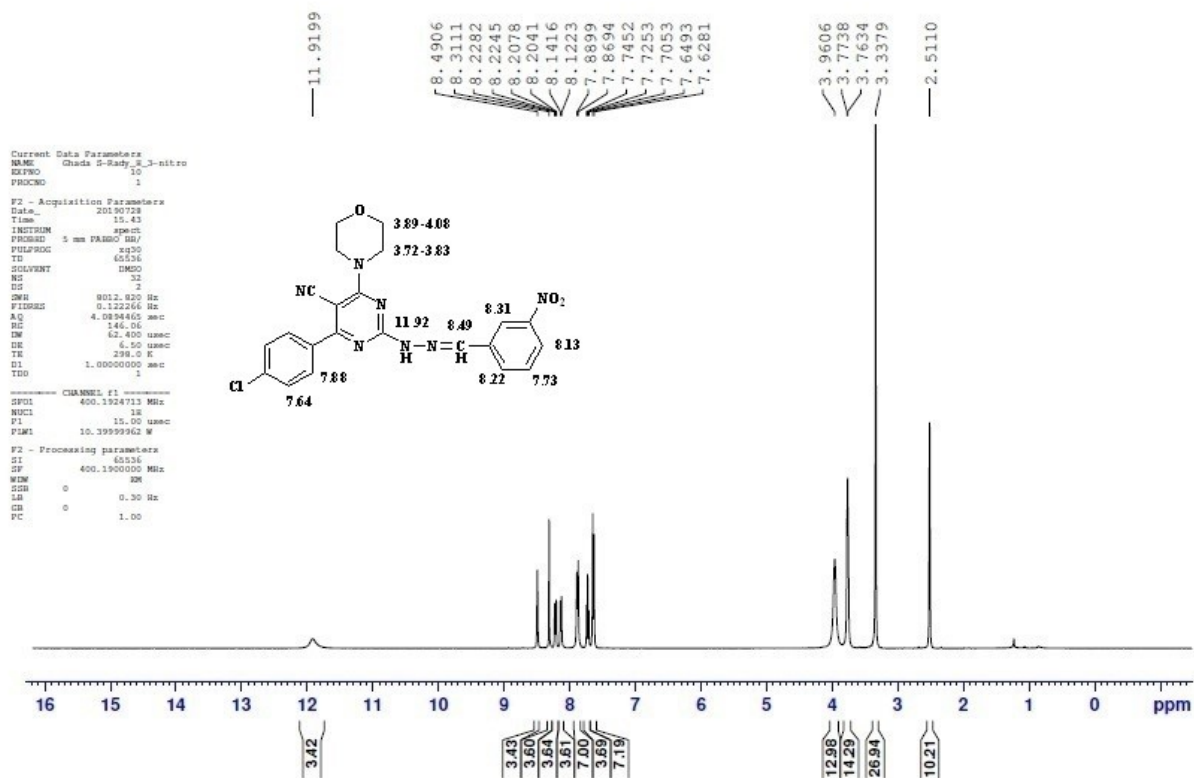


Spectral data of compound 12 e

The IR spectrum of compound 12e



The ¹H NMR spectrum of compound 12e



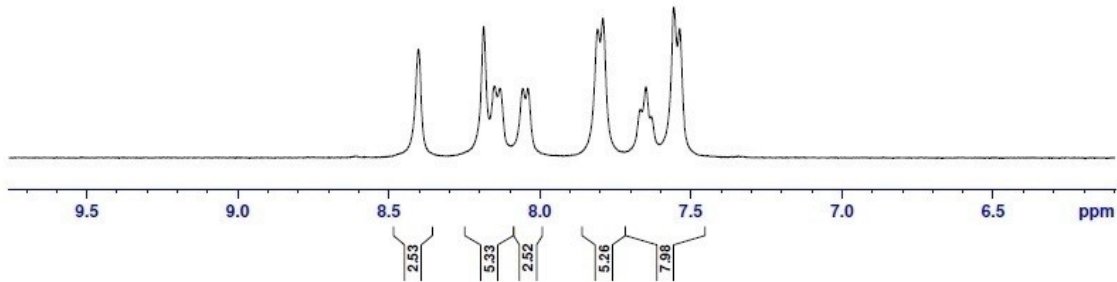
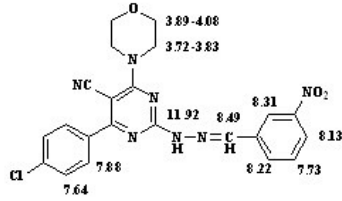
D2O

Current Data Parameters
 NAME Choda 5-Rad_8_3-nitro_D2O
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20180729
 Time 13.39
 INSTRUM spect
 PROBHD 5 mm PASSED 1H/1
 PULPROG zgpg30
 TO 455.34
 SOLVENT DMSO
 NS 12
 DS 4
 SFO1 801.820 Hz
 FREQS 812.234 Hz
 AC 4.008464 sec
 SC 156.48
 SW 62.400 usec
 OR 6.50 usec
 TE 299.2 K
 D1 1.0000000 sec
 DS 1

CHANNEL f1
 SFO1 400.1924713 MHz
 NUC1 13
 P1 15.00 usec
 PL1 10.39999942 W

F2 - Processing parameters
 SI 455.34
 SF 400.1920000 MHz
 SW 0
 SSB 0
 GB 0
 PC 1.00



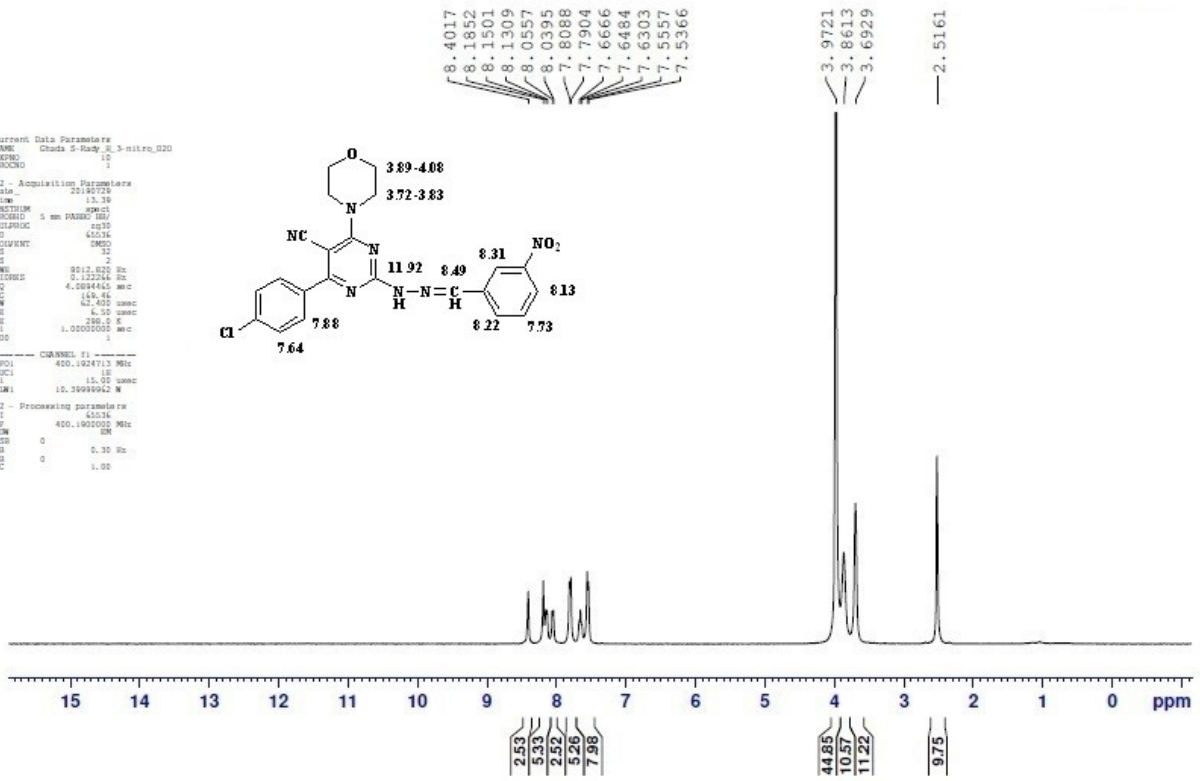
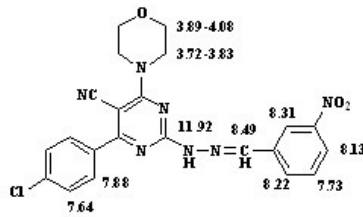
D2O

Current Data Parameters
 NAME Choda 5-Rad_8_3-nitro_D2O
 EXPNO 10
 PROCNO 1

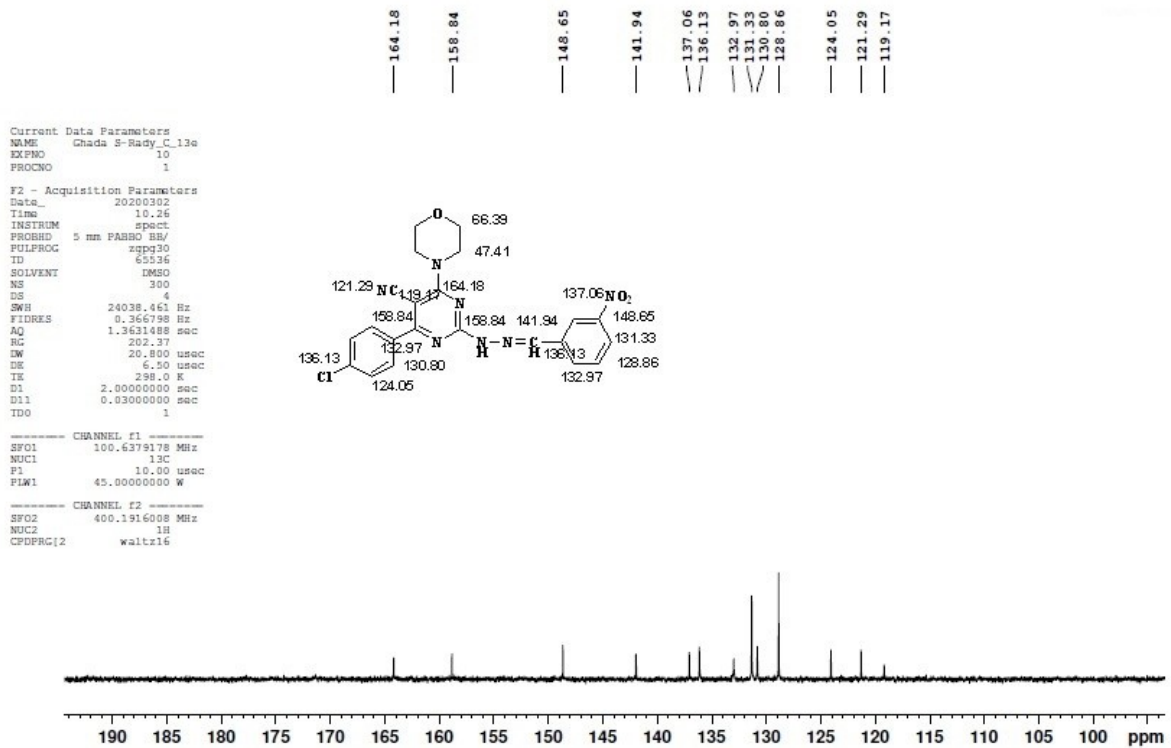
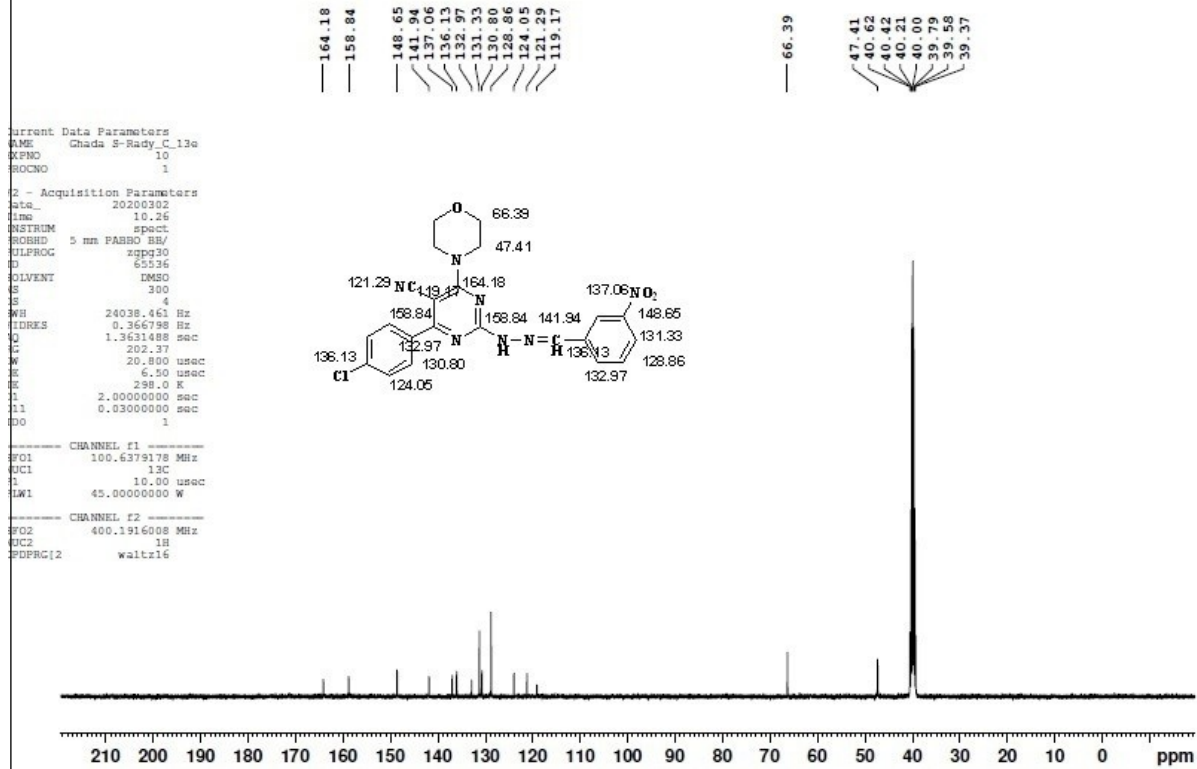
F2 - Acquisition Parameters
 Date_ 20180729
 Time 13.39
 INSTRUM spect
 PROBHD 5 mm PASSED 1H/1
 PULPROG zgpg30
 TO 455.34
 SOLVENT DMSO
 NS 12
 DS 4
 SFO1 801.820 Hz
 FREQS 812.234 Hz
 AC 4.008464 sec
 SC 156.48
 SW 62.400 usec
 OR 6.50 usec
 TE 299.2 K
 D1 1.0000000 sec
 DS 1

CHANNEL f1
 SFO1 400.1924713 MHz
 NUC1 13
 P1 15.00 usec
 PL1 10.39999942 W

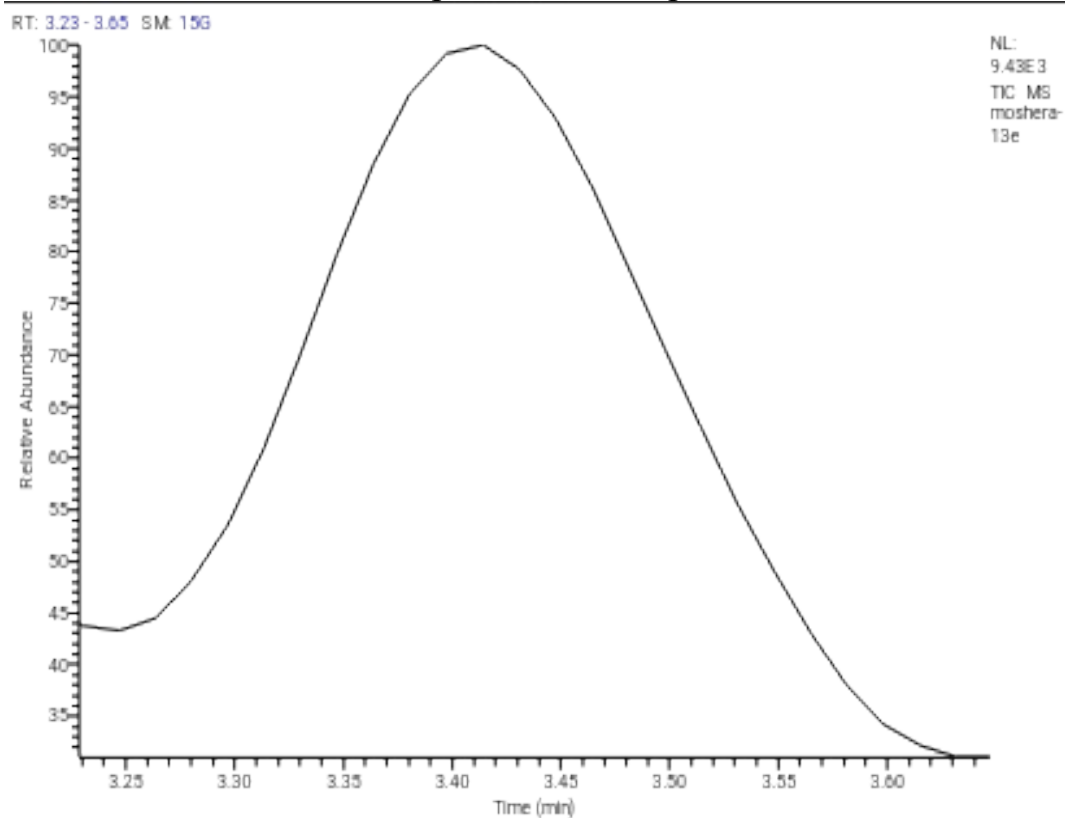
F2 - Processing parameters
 SI 455.34
 SF 400.1920000 MHz
 SW 0
 SSB 0
 GB 0
 PC 1.00



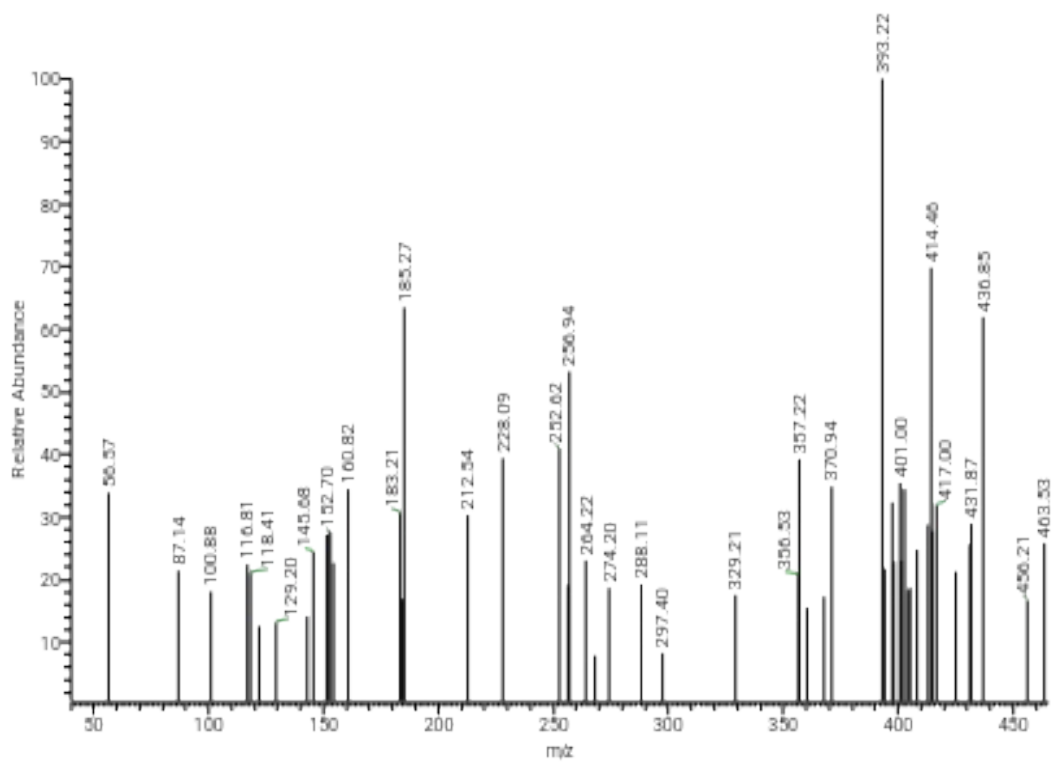
The ¹³C NMR spectrum of compound 12e



The mass spectrum of compound 12e

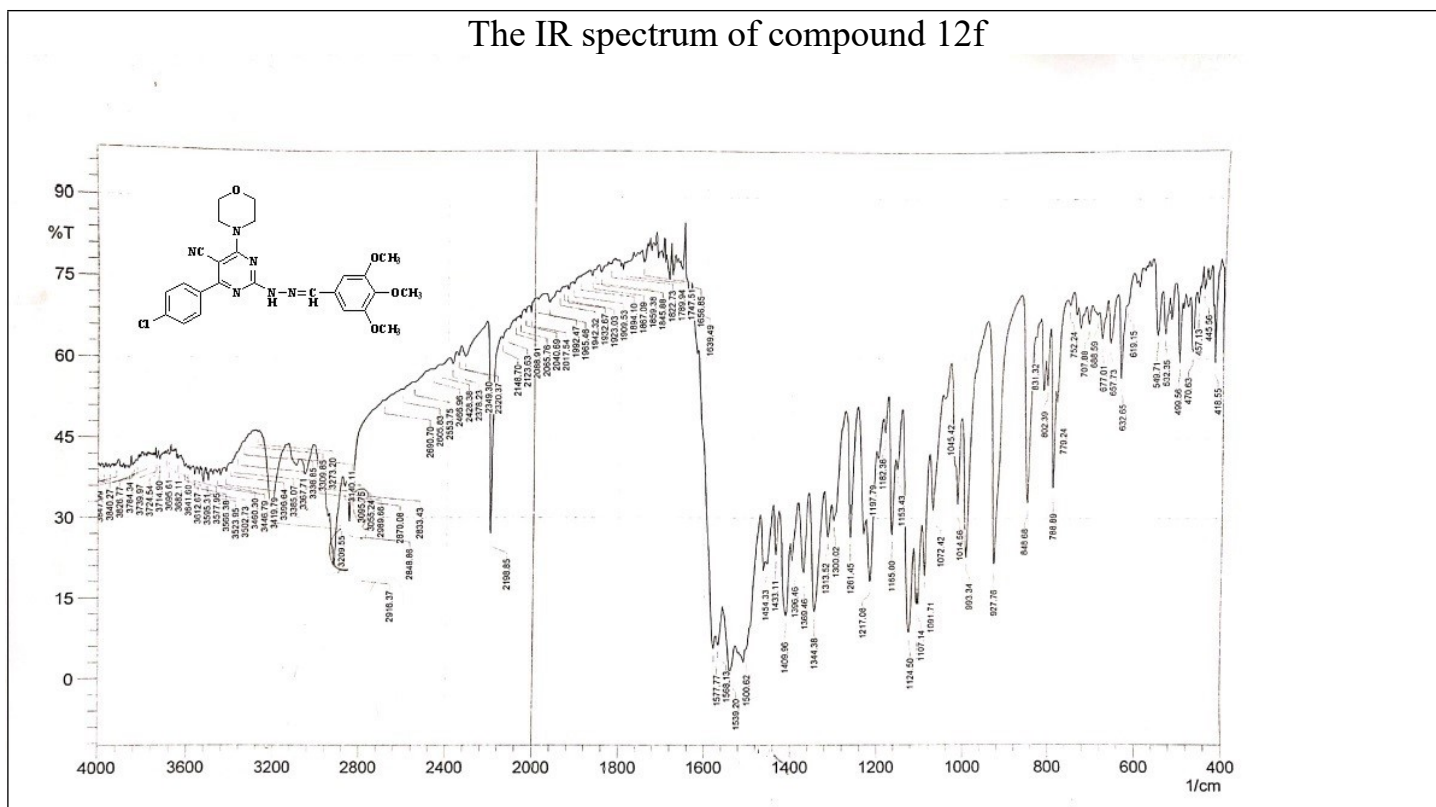


moshera-13e #34 RT: 0.59 AV: 1 SB: 2 4.45, 4.45 NL: 3.92E2
T: {0,0} +c EI Full ms [40.00-1000.00]

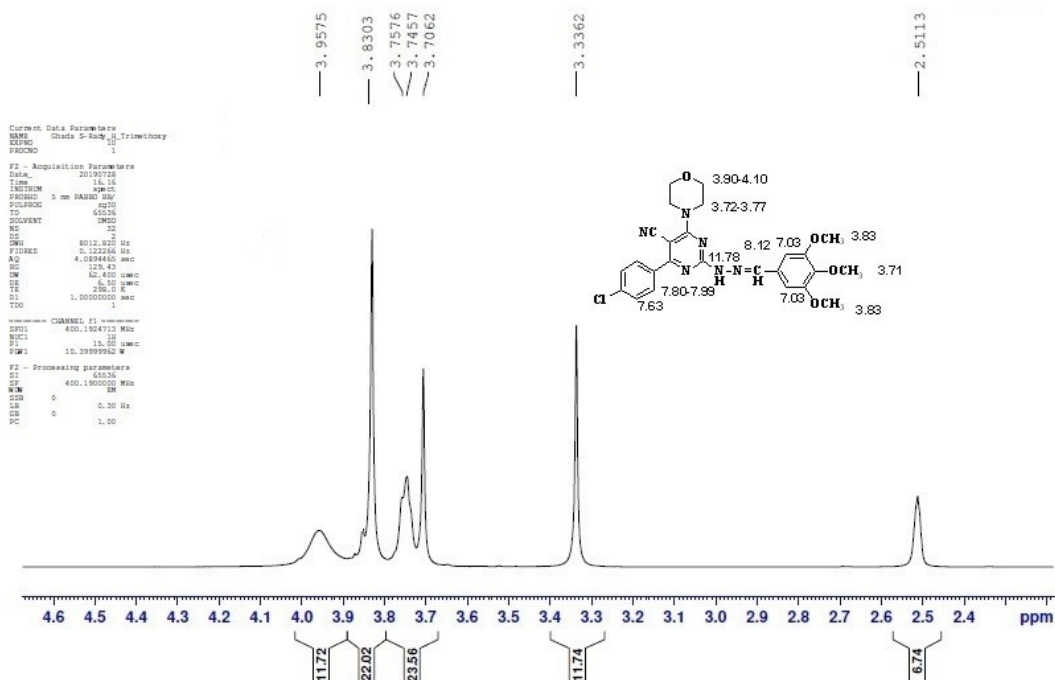
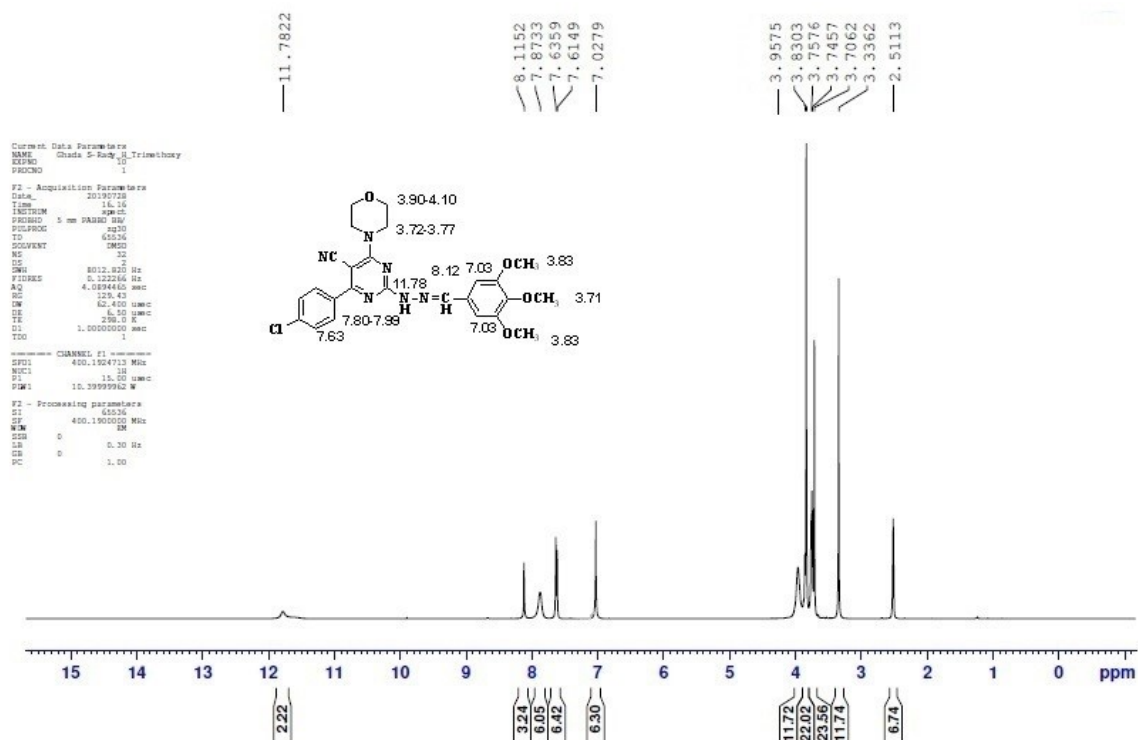


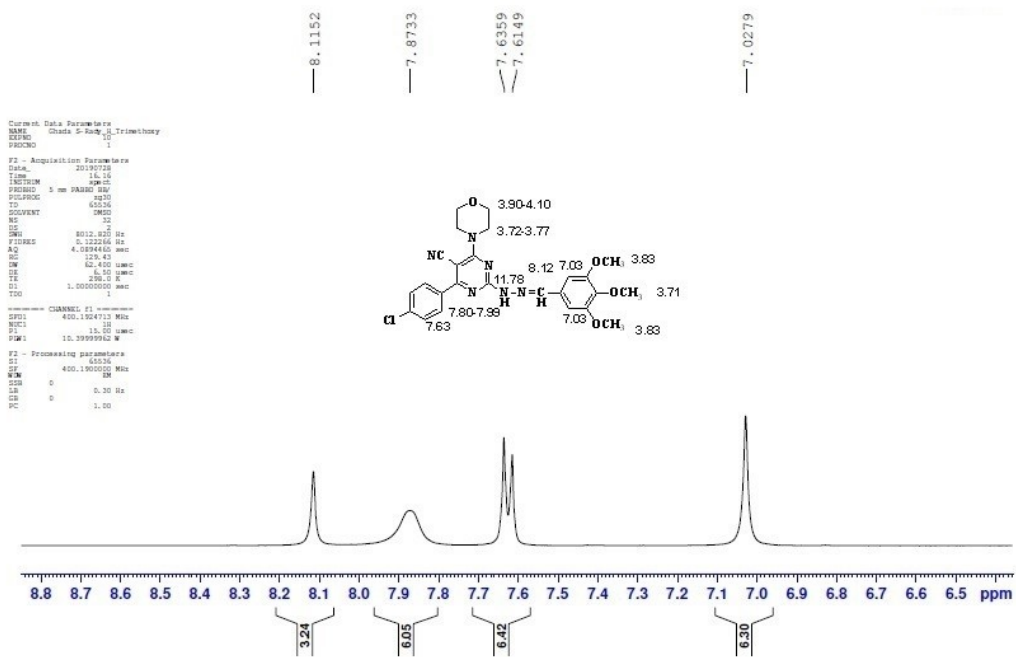
Spectral data of compound 12f

The IR spectrum of compound 12f

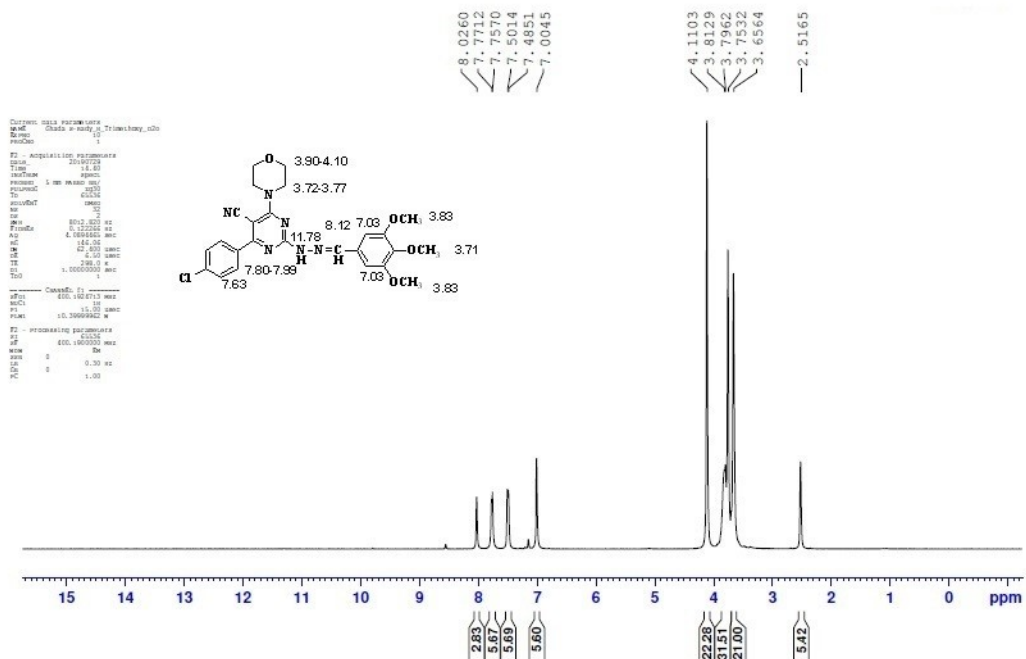


The ¹H NMR spectrum of compound 12f

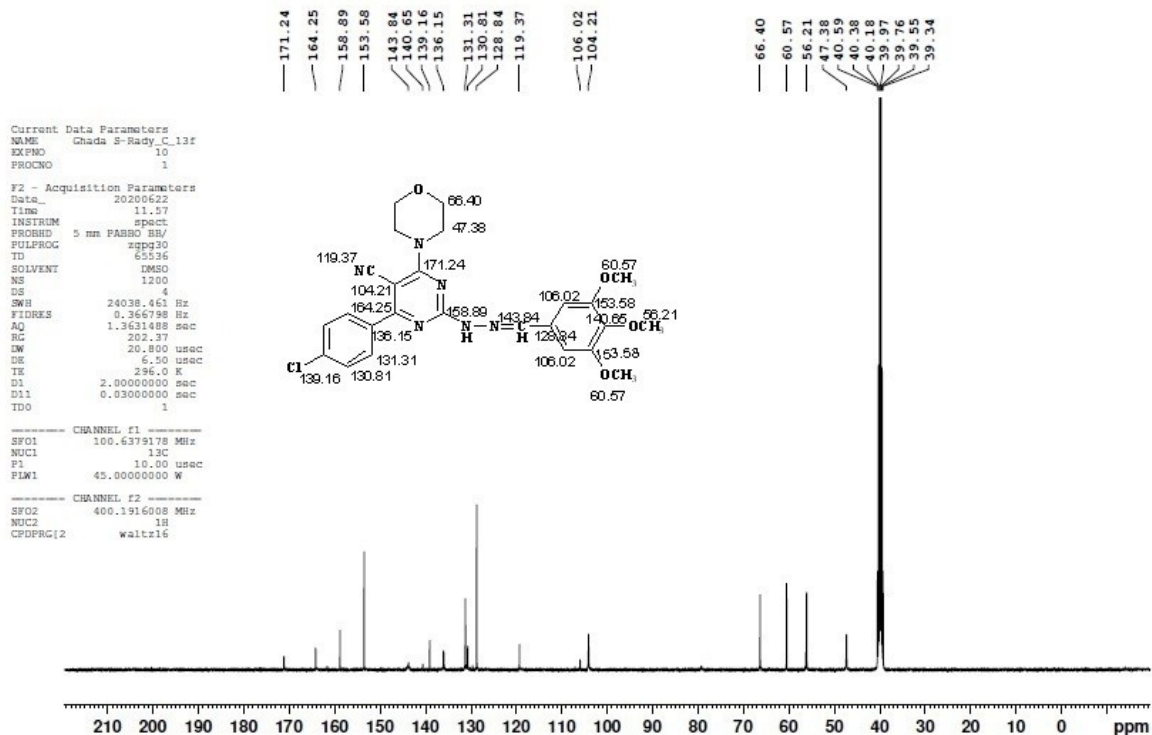




D2O

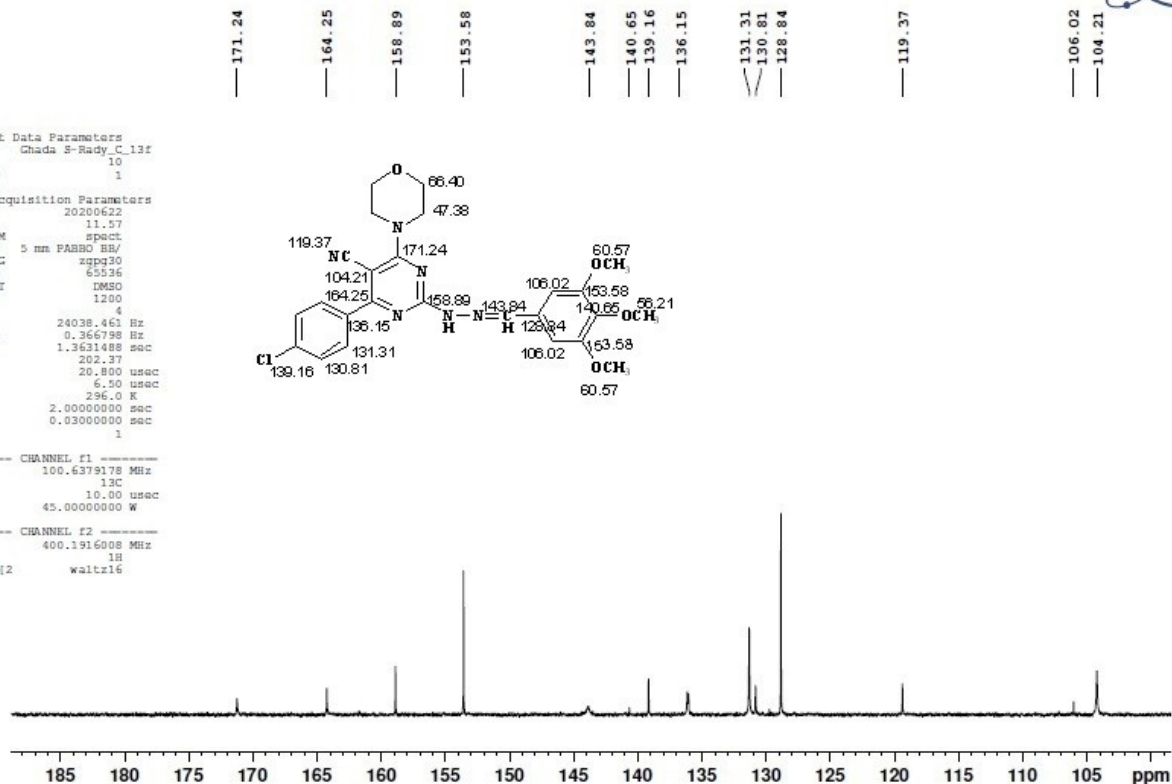


The ¹³C NMR spectrum of compound 12f

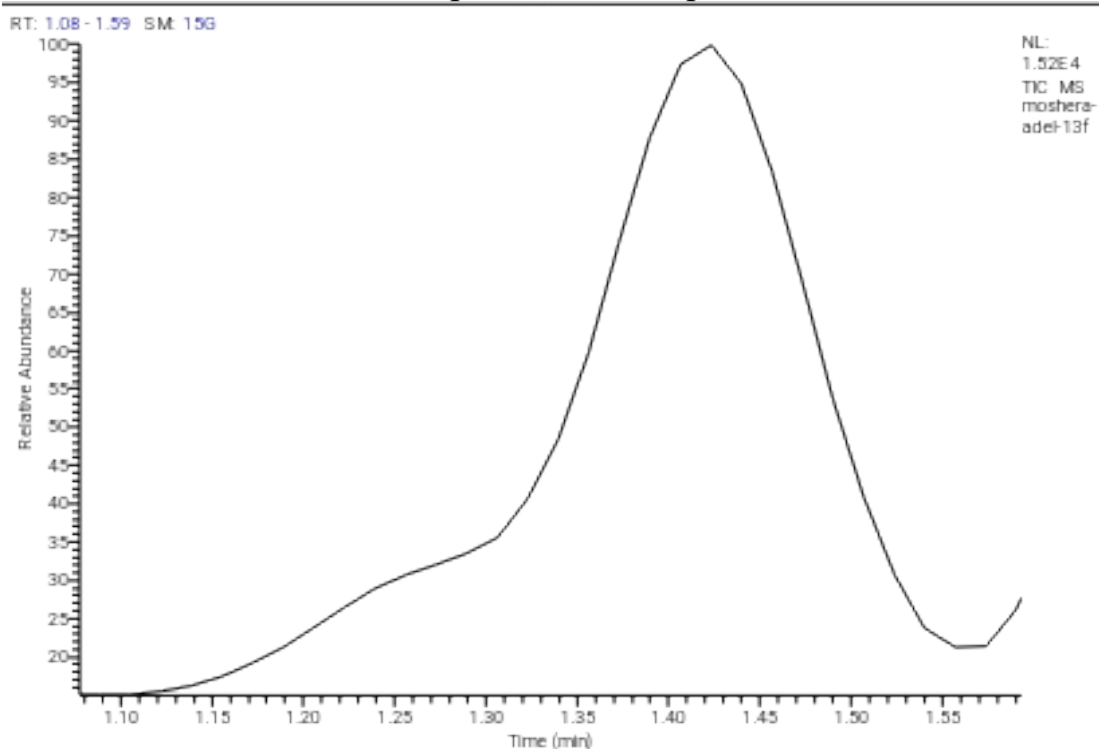


Ghada S-Rady_C_13f

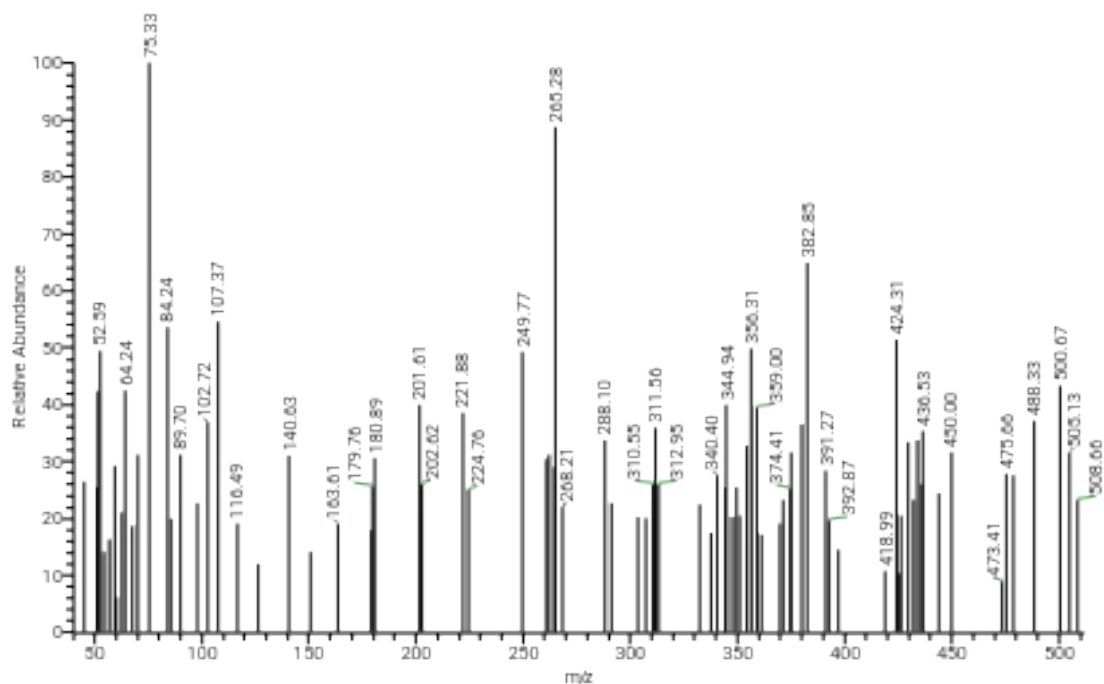
Microanalytical Unit - FOPCU - NMR laboratory
www.pharma.cu.edu.eg dir-mau.fopcu@pharma.cu.edu.eg



The mass spectrum of compound 12f

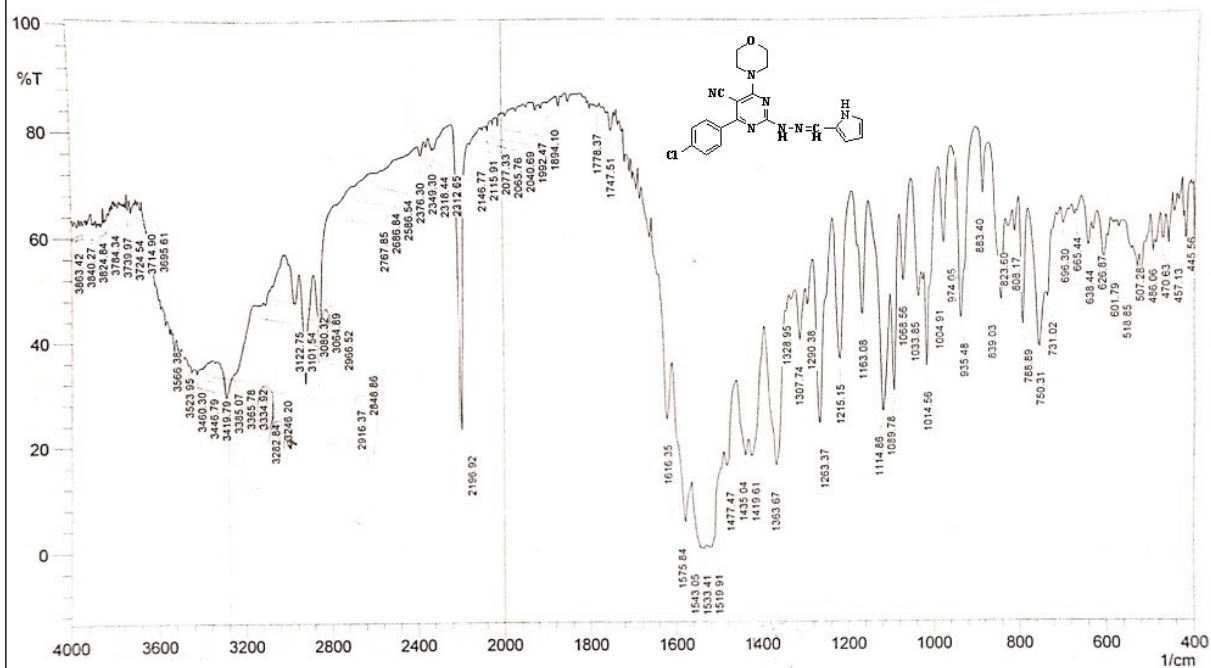


moshera-adel-13f #102 RT: 1.72 AV: 1 SB: 2 2.83, 2.83 NL: 4.08E2
T: {0,0} + c E1Full ms [40.00-1000.00]

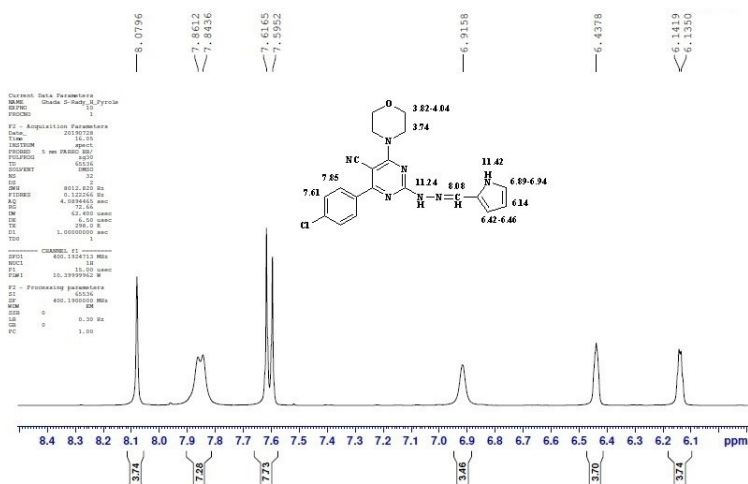
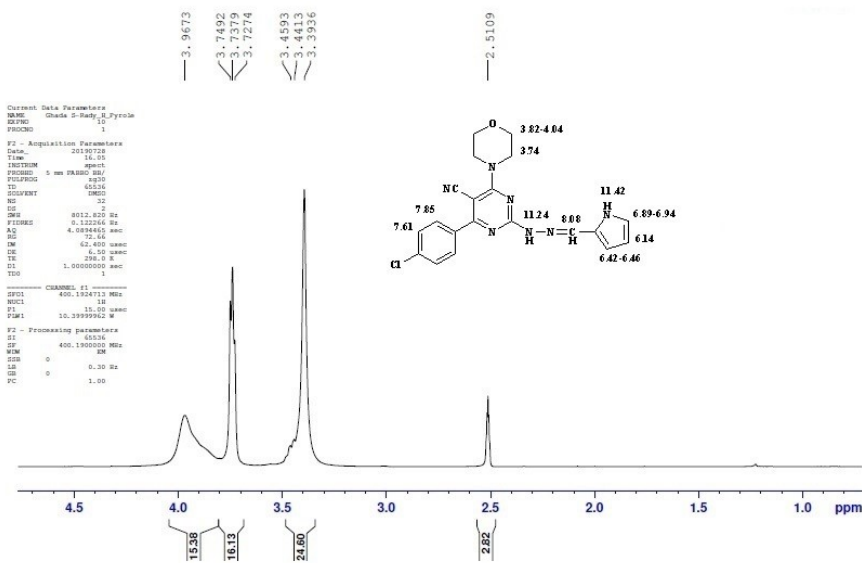
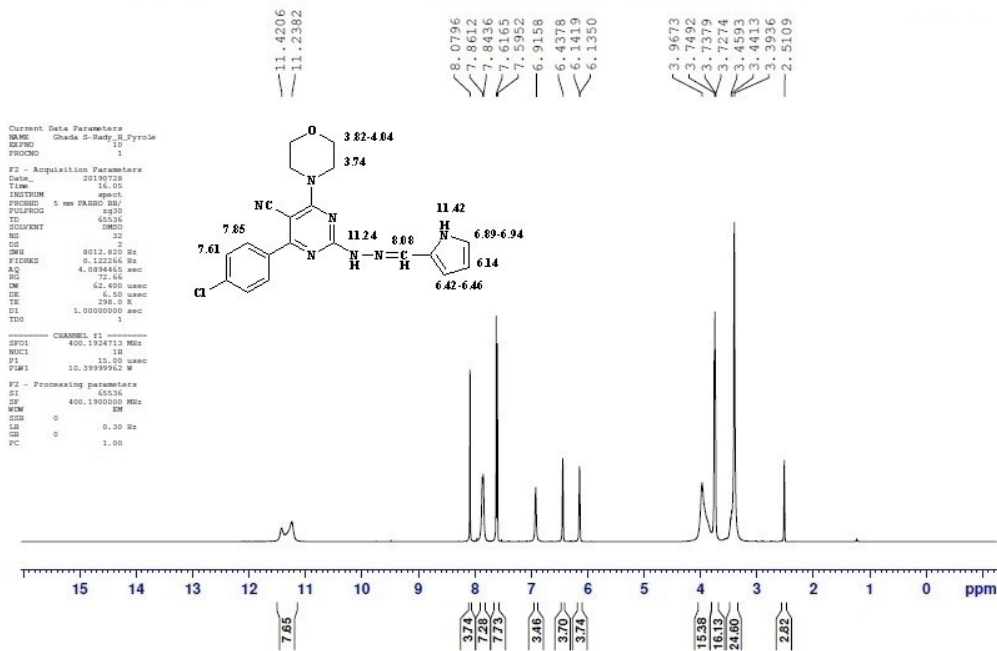


Spectral data of compound 12g

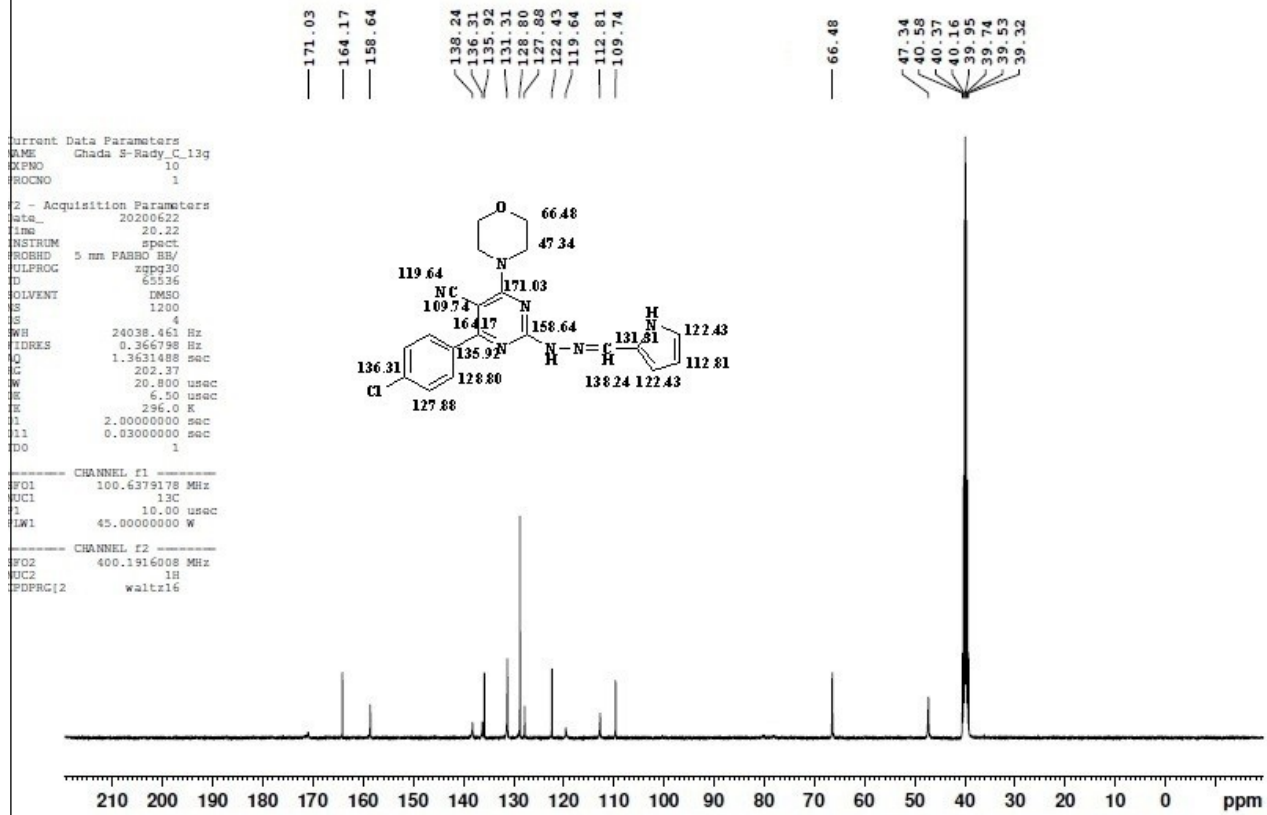
The IR spectrum of compound 12g



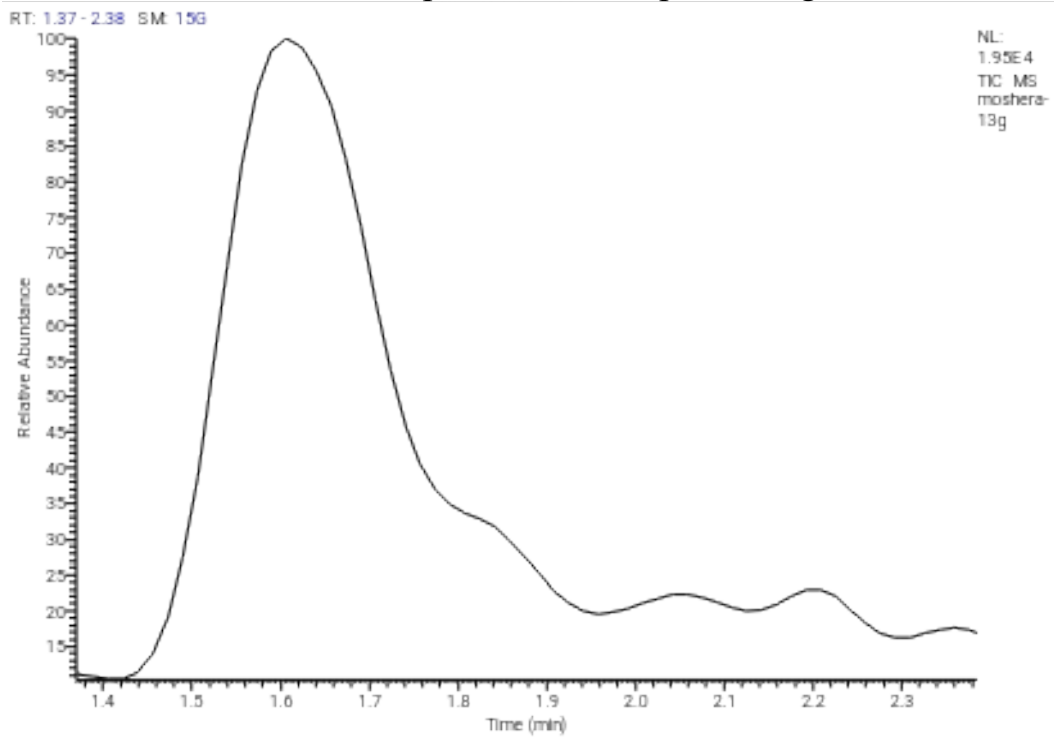
The ¹H NMR spectrum of compound 12g



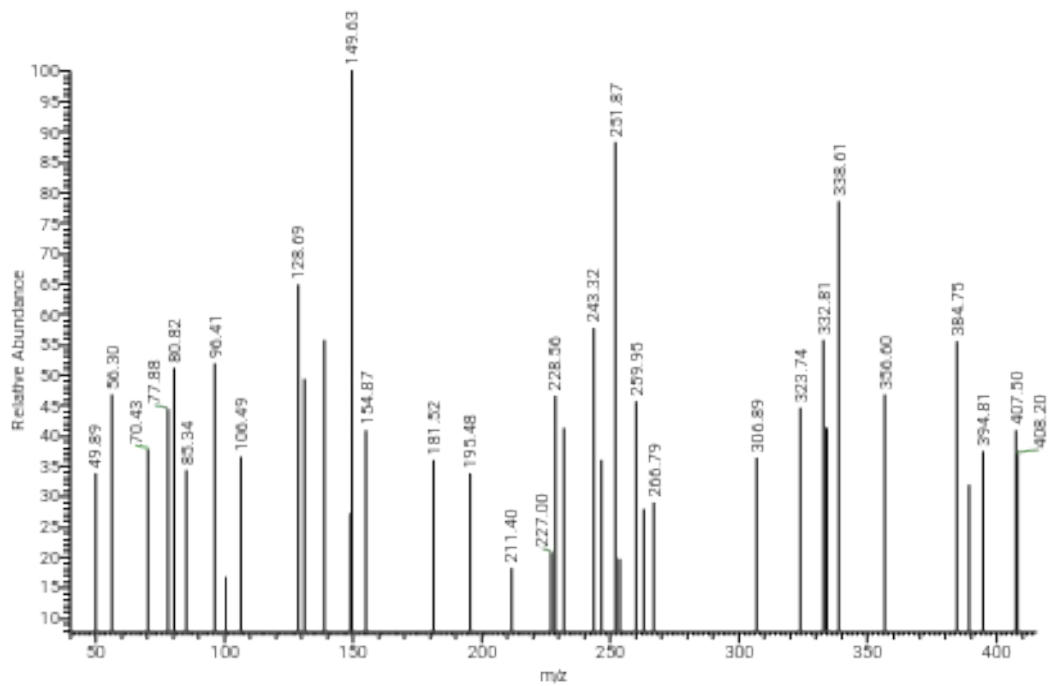
The ¹³C NMR spectrum of compound 12g



The mass spectrum of compound 12g

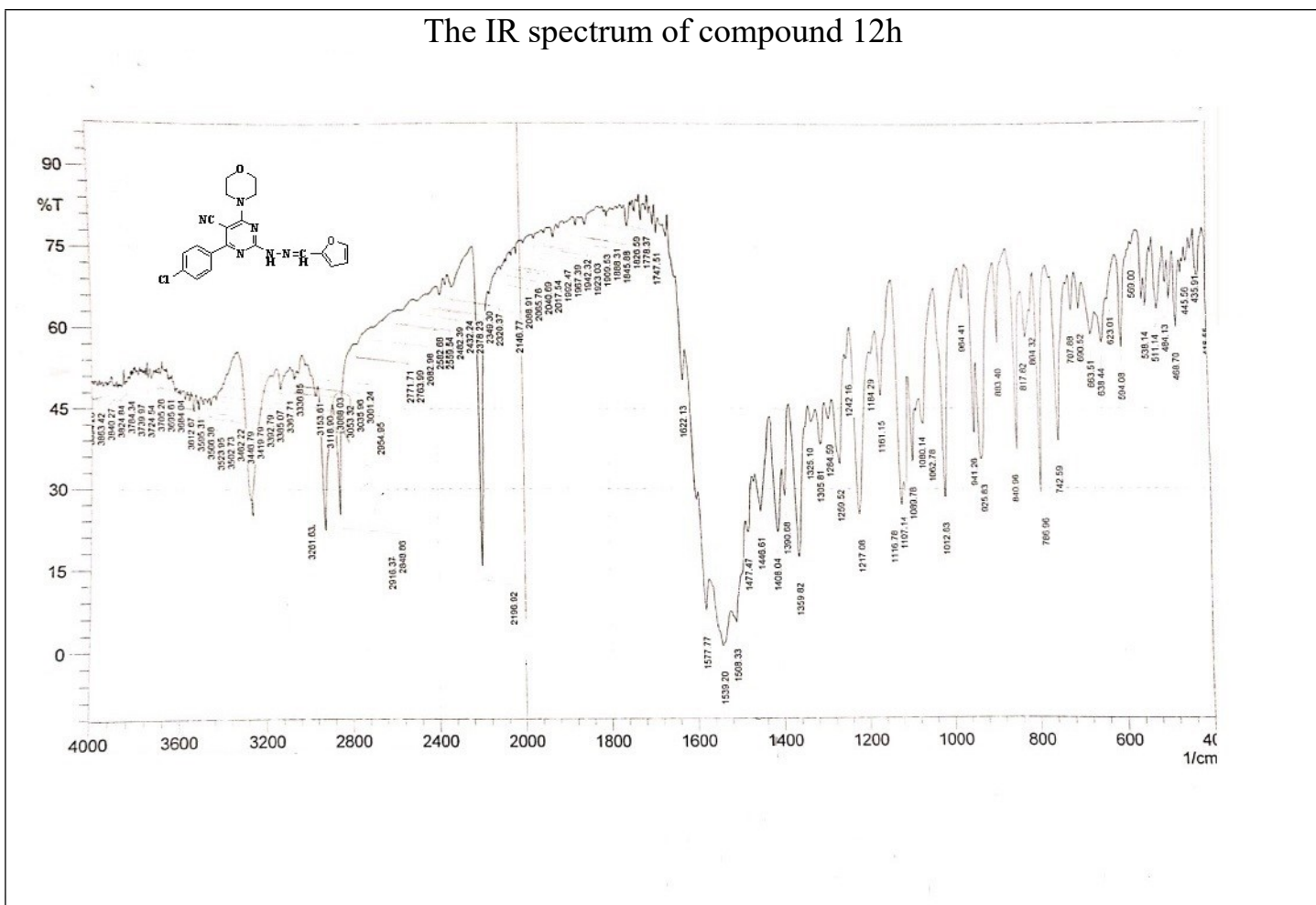


moshera-13g #243 RT: 4.08 AV: 1 SB: 2 4.45, 4.45 NL: 2.50E2
T: {0,0} + cEI Full ms [40.00-1000.00]

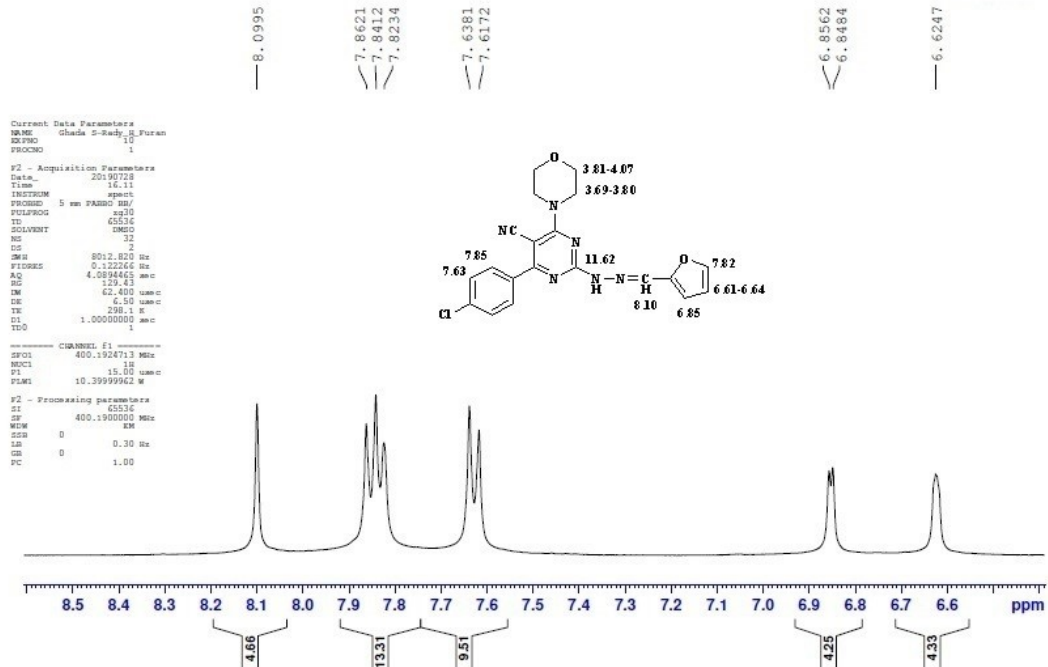
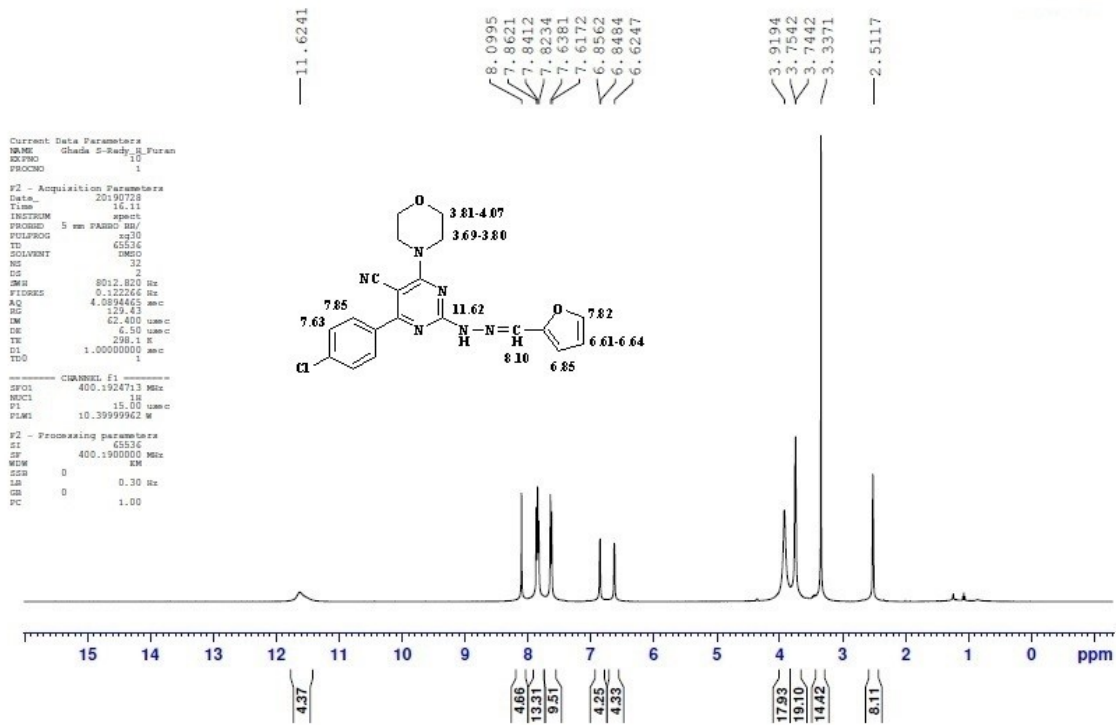


Spectral data of compound 12h

The IR spectrum of compound 12h

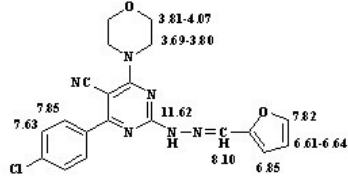


The ¹H NMR spectrum of compound 12h



D2O

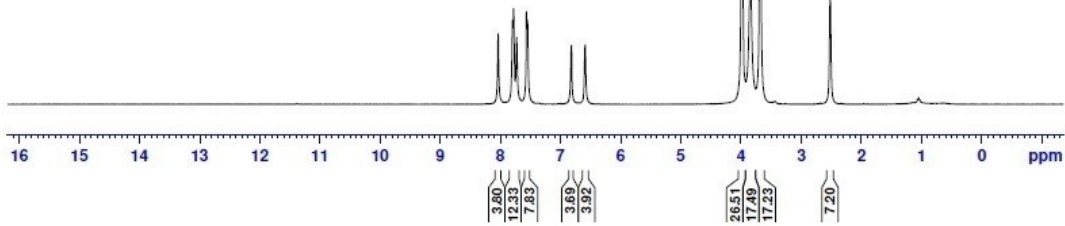
Current Data Parameters
NAME Ghada 5-Ring_4_Furan_D2O
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20191213
Time 14.33
INSTRUM spect
PROBHD 5 mm QNP1H
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 32
DS 2
SWH 8012.820 Hz
F2RES 0.322566 Hz
AQ 4.0194445 sec
RG 344.56
DQ 12.400 umc
DE 6.50 umc
TE 300.2 K
D1 1.00000000 sec
TDO 1
===== CHANNEL f1 =====
NUC1 13C
P1 15.00 umc
PWL1 10.39999962 W
F2 - Processing parameters
SI 60076
SF 400.1460000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



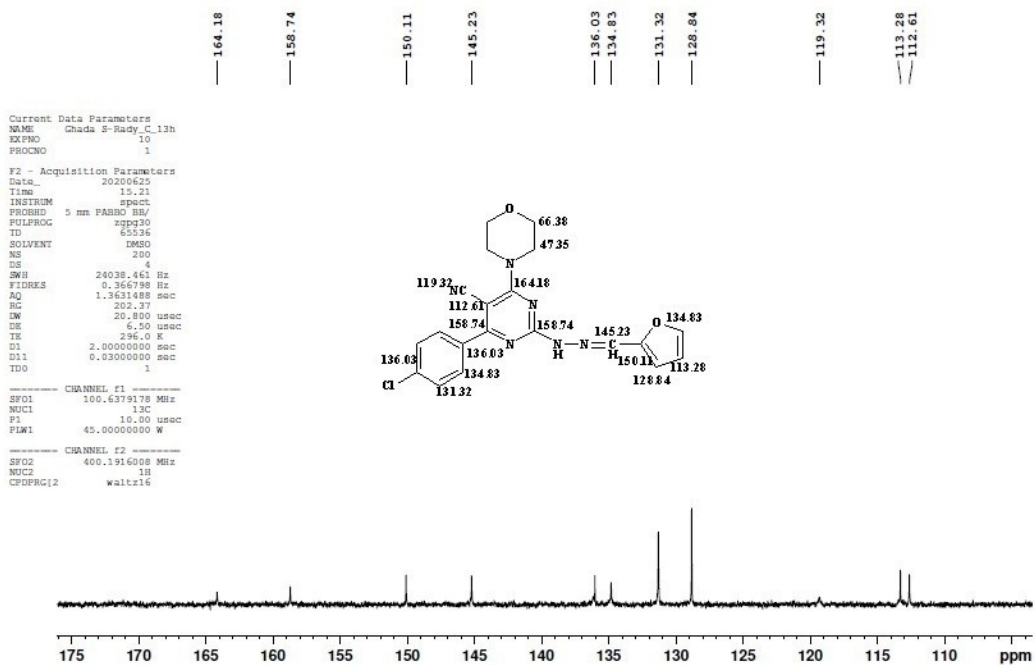
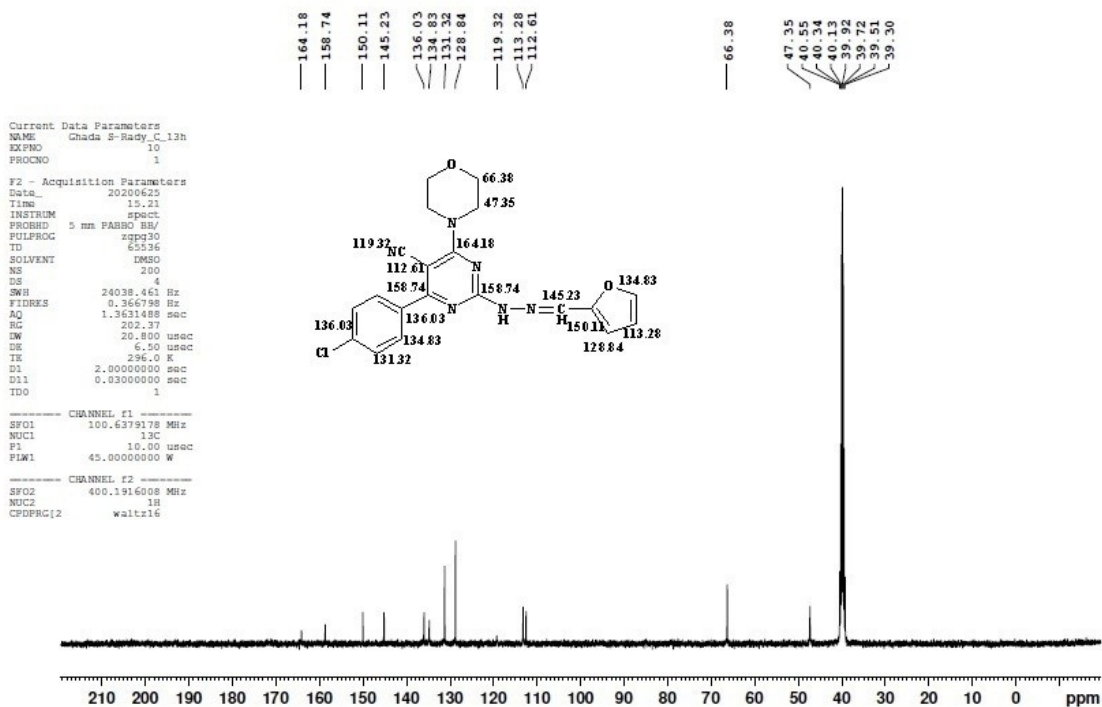
8.0375
7.7999
7.7819
7.7279
7.5645
7.5464
6.8221
6.5898

3.9860
3.8449
3.6801

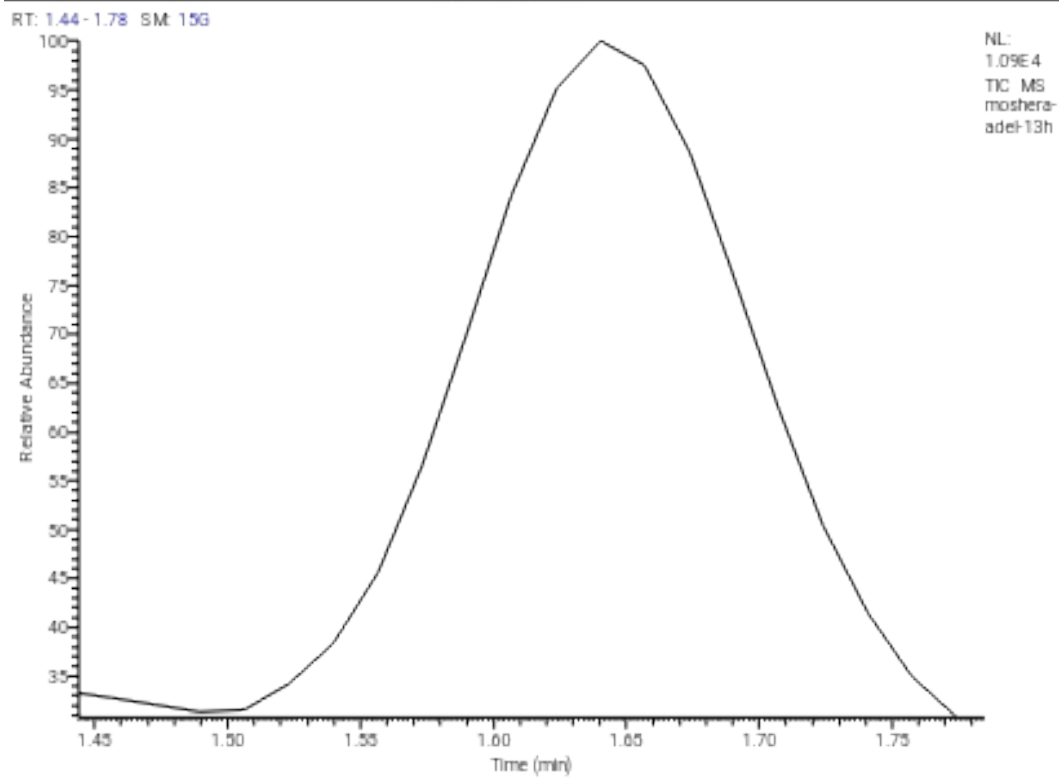
2.5169



The ¹³C NMR spectrum of compound 12h



The mass spectrum of compound 12h



moshera-adel-13h #67 RT: 1.14 AV: 1 SB: 2 4.45, 4.45 NL: 3.00E2
T: {0,0} +cEIFull.ms [40.00-1000.00]

